

March 14, 1944.

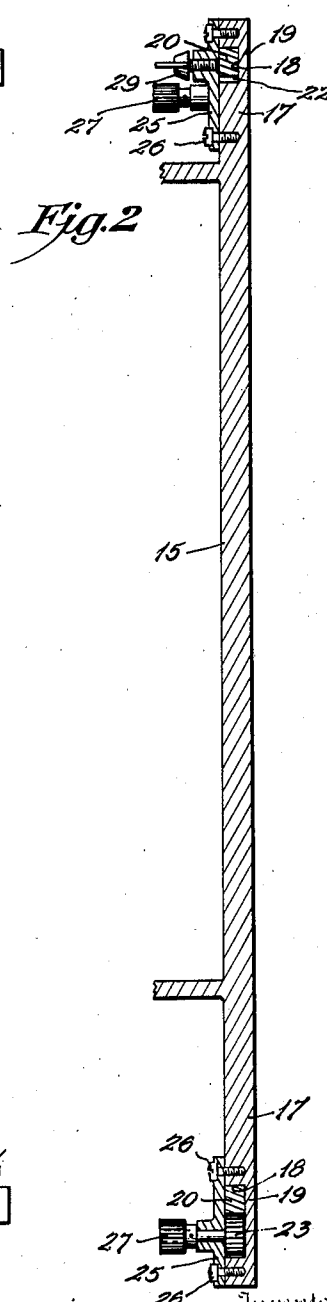
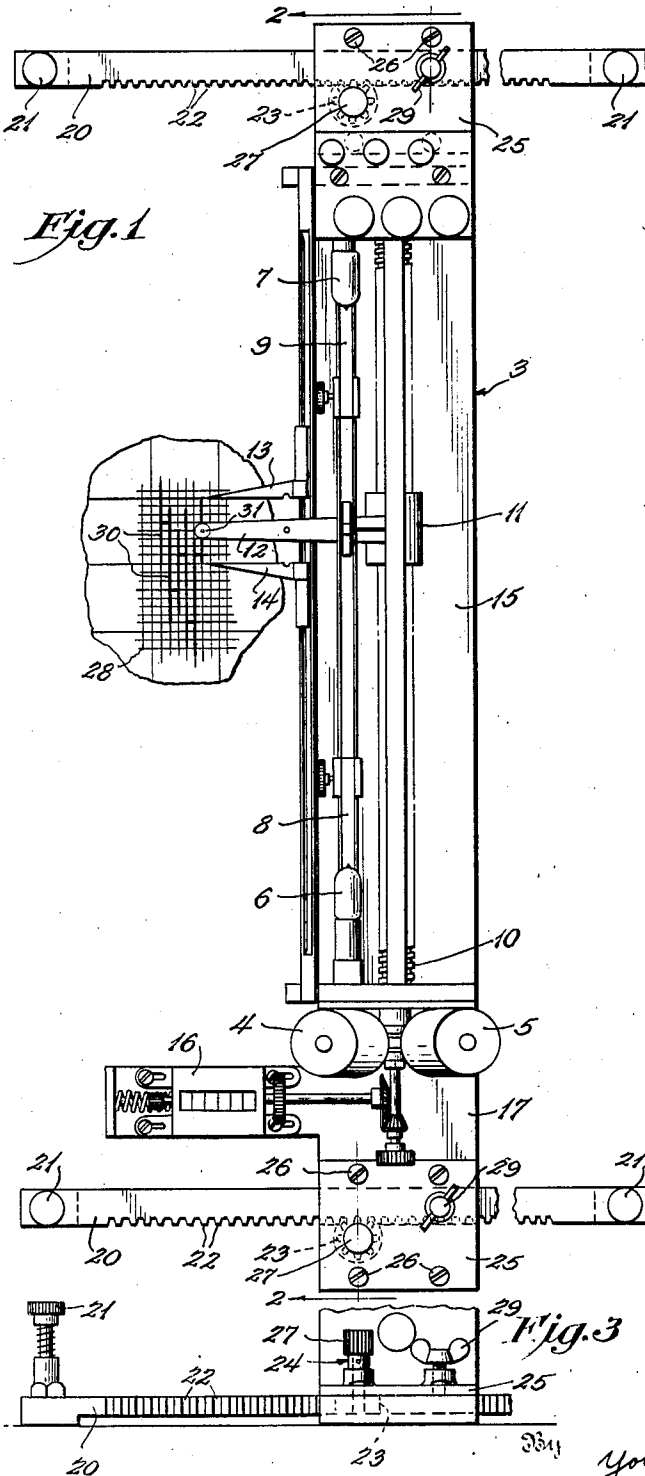
H. H. BARNARD

2,344,199

MOUNTING AND ADJUSTING DEVICE FOR RECORDING INSTRUMENTS

Filed Feb. 26, 1942

5 Sheets-Sheet 1



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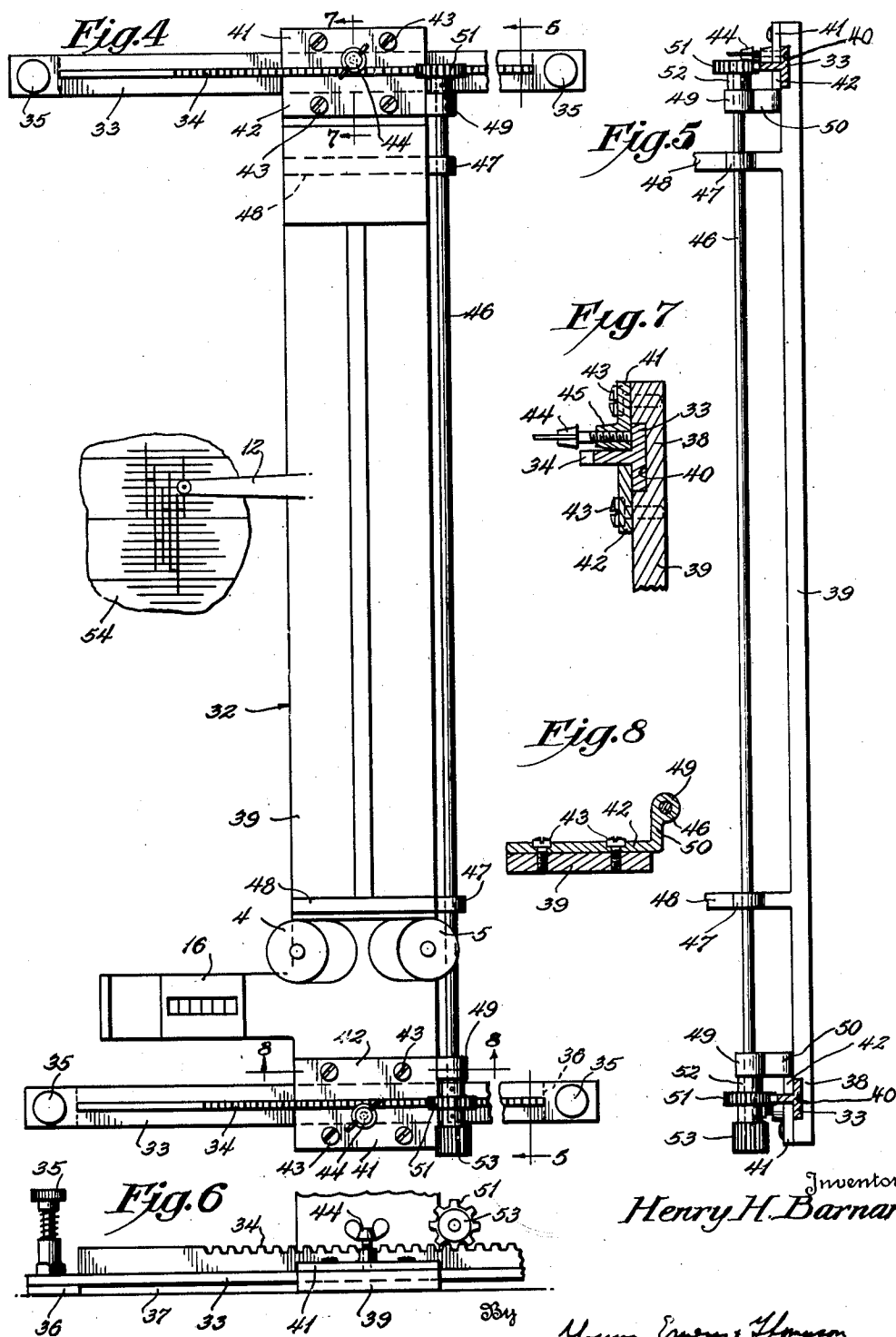
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MOUNTING AND ADJUSTING DEVICE FOR RECORDING INSTRUMENTS

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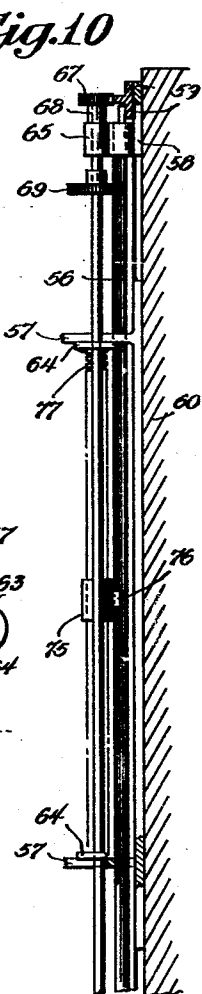
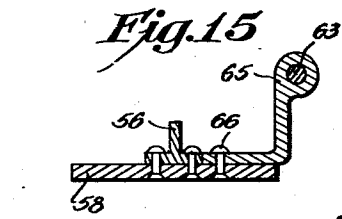
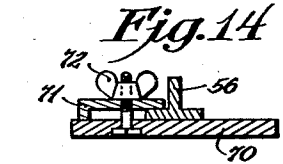
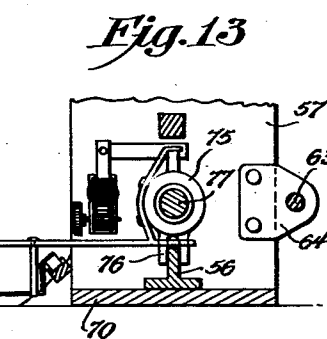
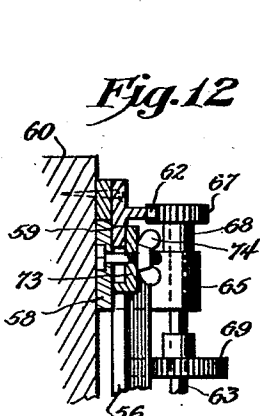
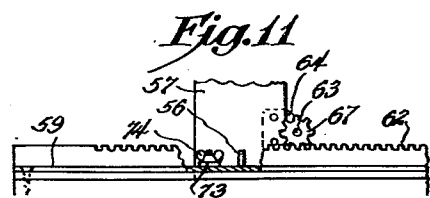
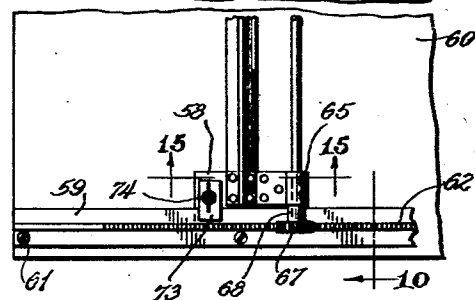
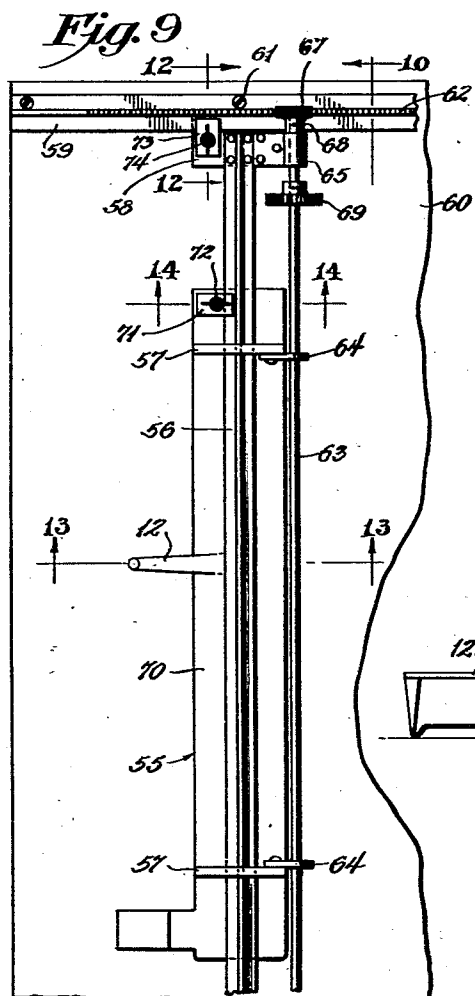
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MOUNTING AND ADJUSTING DEVICE FOR RECORDING INSTRUMENTS

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5 Sheets-Sheet 3



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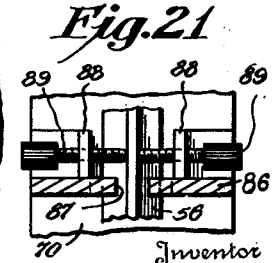
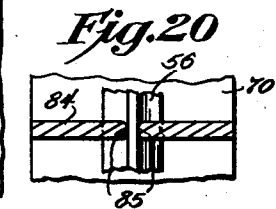
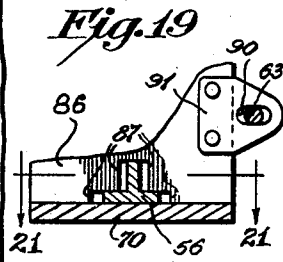
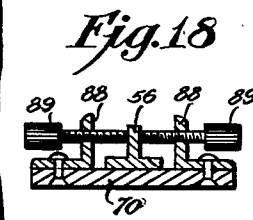
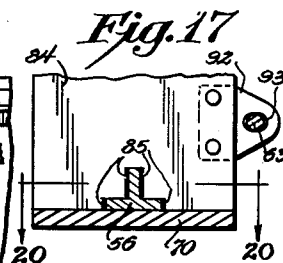
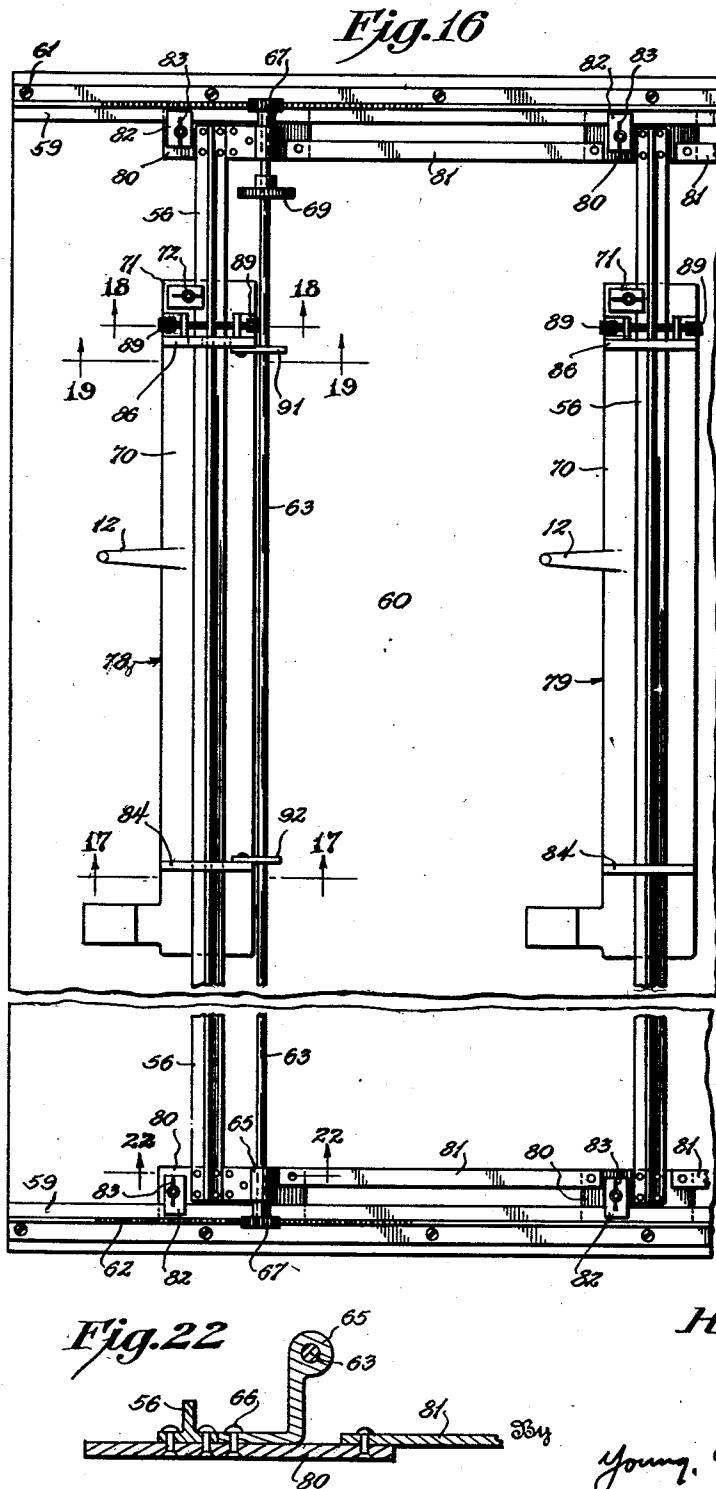
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MOUNTING AND ADJUSTING DEVICE FOR RECORDING INSTRUMENTS

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5 Sheets-Sheet 4



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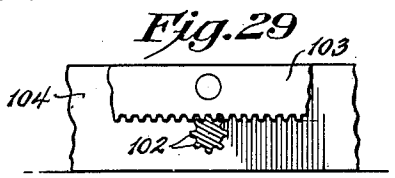
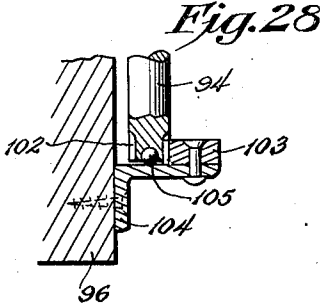
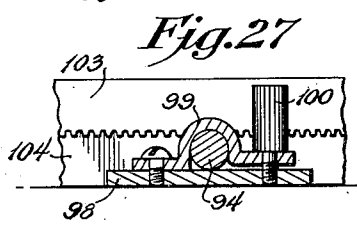
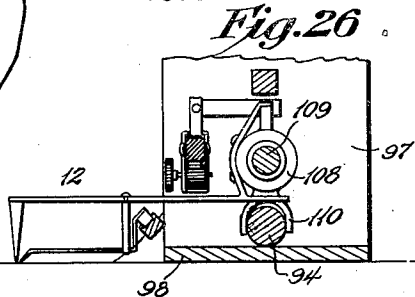
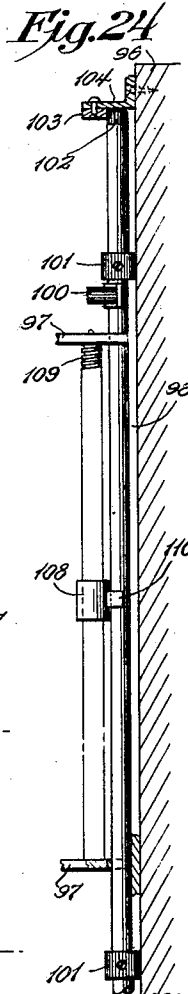
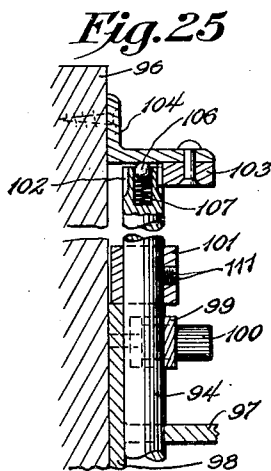
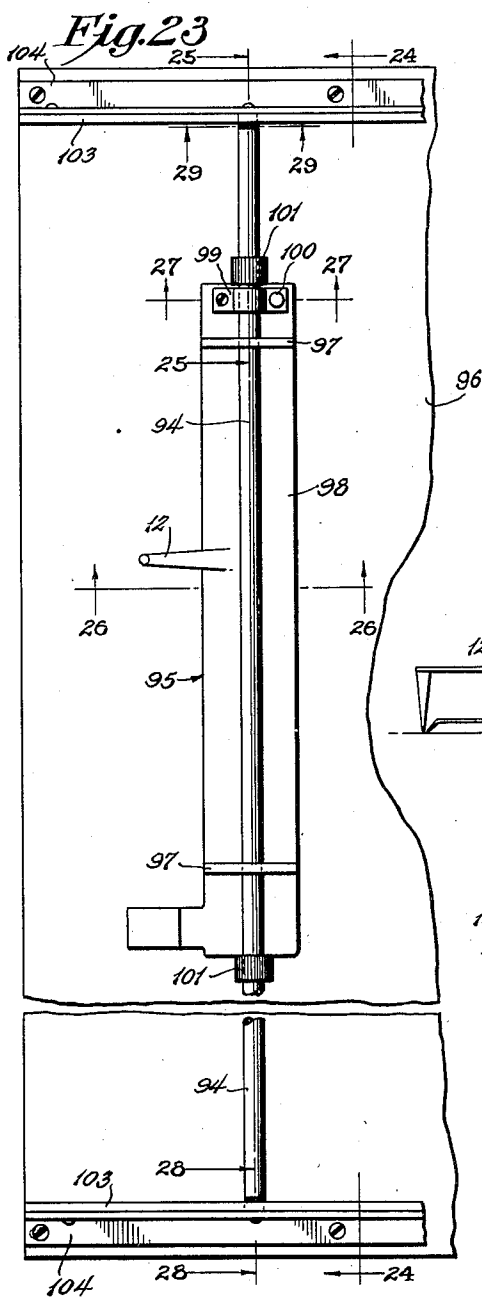
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MOUNTING AND ADJUSTING DEVICE FOR RECORDING INSTRUMENTS

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5 Sheets-Sheet 5



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UNITED STATES PATENT OFFICE

2,344,199

MOUNTING AND ADJUSTING DEVICE FOR
RECORDING INSTRUMENTS

Henry H. Barnard, Washington, D. C.

Application February 26, 1942, Serial No. 432,517

4 Claims. (Cl. 33—32)

The present invention relates to a recording and indicating instrument of the general type disclosed in my co-pending application Serial No. 368,696, filed December 5, 1940.

It is an object of the present invention to mount the recording and indicating device so that it can be adjusted periodically in a lateral direction relative to the direction of the indicating and recording movements of the device. A further object of the invention is to provide mounting and adjusting means on the ends of the device so that the latter may be shifted and accurately adjusted.

Further objects will be apparent from the following description taken in connection with the accompanying drawings in which:

Figure 1 is a plan view of the instrument and its adjusting details,

Fig. 2 is a longitudinal sectional view taken on line 2—2 of Fig. 1 with some of the parts of the instrument omitted,

Fig. 3 is a side elevation of one end of the instrument,

Fig. 4 is a plan view of a modified instrument and adjusting elements,

Fig. 5 is a sectional view taken on line 5—5 of Fig. 4,

Fig. 6 is an end view of a portion of the instrument and elements of Fig. 4,

Fig. 7 is a cross section taken on line 7—7 of Fig. 4,

Fig. 8 is a cross section taken on line 8—8 of Fig. 4,

Fig. 9 is a plan view of another modified instrument and adjusting elements mounted on a board,

Fig. 10 is a sectional view taken on line 10—10 of Fig. 9,

Fig. 11 is an end view of the instrument, elements and board of Fig. 9,

Fig. 12 is a cross section taken on line 12—12 of Fig. 9,

Fig. 13 is a cross section taken on line 13—13 of Fig. 9,

Fig. 14 is a cross section taken on line 14—14 of Fig. 9,

Fig. 15 is a cross section taken on line 15—15 of Fig. 9,

Fig. 16 is a plan view of a further modified instrument and adjusting elements mounted on a board,

Figs. 17, 18 and 19 are cross sections taken on lines 17—17, 18—18 and 19—19 respectively of Fig. 16,

Fig. 20 is a horizontal section taken on line 20—20 of Fig. 17,

Fig. 21 is a horizontal section taken on line 21—21 of Fig. 19,

Fig. 22 is a cross section taken on line 22—22 of Fig. 16,

Fig. 23 is a plan view of another modified instrument and adjusting elements,

Fig. 24 is a cross section taken on line 24—24 of Fig. 23,

Fig. 25 is a section taken on line 25—25 of Fig. 23,

Figs. 26 and 27 are cross sections taken on line 26—26 and 27—27 respectively of Fig. 23,

Fig. 28 is a section taken on line 28—28 of Fig. 23, and

Fig. 29 is a section taken on line 29—29 of Fig. 23.

The actual indicating and recording instrument 3 comprises such parts as the solenoids 4 and 5, lamps 6 and 7, contact strips 8 and 9, threaded actuating rod 10, threaded nut 11, pointer and recording bar 12, limit pointers 13 and 14, base plate 15 and odometer or counter 16, all of which have been described in detail, together with other elements, in my said application and in my co-pending application Serial No. 430,812, filed February 13, 1942.

According to the present invention the base plate 15 has extended end portions 17, each of which is provided with a lateral groove 18 extending across its portion 17. As shown in Figs. 2 and 3, the groove 18 is cut into the upper surface of the portions 17 in order to leave a section 19 on the bottom part. Each groove or slot 18 receives a supporting bar 20.

Each bar or rack 20 is provided with a suitable number of securing pins 21, one on each end, and by means of such pins the bars together with the instrument 3 may be secured on a board or other support, not shown. Also, each bar 20 is provided with a gear rack composed of a plurality of teeth 22 which are adapted to mesh with a gear 23 of a setting device 24. Each setting device 24 is mounted on a retaining plate 25 which is suitably secured on its respective end portion 17 by means of screws 26. Also, each setting device 24 is provided with a knurled knob 27 by means of which the respective gear 23 may be rotated to adjust the instrument relative to the bars 20 and a record sheet 28.

In order to lock the instrument 3 in a set and adjusted position, each plate 25 is provided with a winged nut lock 29 which, as shown in Fig. 2,

is adapted to contact its respective bar 20 when screwed down.

The heavy lines 30 on the record sheet 28 indicate the lines recorded by the marking device or stylus 31 during the posting of the items in the machine 3.

In operation the instrument of Figs. 1 to 3 is adjusted laterally by first loosening the winged nuts 29 and then turning the knobs 27 whereby the rotation of the gears 23, in contact with the teeth 22 of the racks 20, will adjust the instrument to the right or left, Fig. 1, as may be desired, such distance which may be required. Thereafter the winged nuts 29 are again tightened and the machine is in position for a further recording.

The instrument 32 of Figs. 4 to 8 is similar to the one shown in Figs. 1 to 3. The guide tracks or supporting bars 33 are each provided with a central gear rack 34 and end pins 35 by means of which the bars may be secured on a board or other support. As shown in Fig. 6, each end of the bar 33 is supported on a plate 36 to leave a longitudinal space 37 between the bar and the support to accommodate the portion 38 of the base plate 39 of the instrument. Each end of the base plate 39 is thus provided with a groove 40 to receive its respective bar 33. A pair of securing or retaining plates 41 and 42 is fastened to the base plate by screws 43 on each side of the gear rack 34 in order to secure the instrument in a slidable relationship on the bars 33. In order to lock the instrument 32 in adjusted position, each end thereof is provided with a winged nut 44 threaded in a collar 45, Fig. 7, on the plate 41 and having its end bearing on the bar 33 when in the locked position.

An adjusting rod 46 extends the approximate length of the machine and is rotatably mounted in two bearings 47, each of which is secured on an upright 48 of the instrument. Each securing plate 42 is also provided with a bearing 49 on an extended portion 50 bent at right angles to the plate. At each end of the rod 46 a gear 51 is secured spaced from the bearing 49 by means of a spacing collar 52, Fig. 5. A knurled knob 53 is fastened on one end of the rod 46, Figs. 4 and 5, to permit easy rotation of the rod 46 and thereby the gears 51 to adjust the instrument 32 relative to the bars 33 and a record sheet 54.

The device of Figs. 4 to 8 operates similar to the device of Figs. 1 to 3 insofar as adjustment is concerned, except that in the device of Figs. 4 to 8 it is merely necessary to turn the knob 53, after loosening the nuts 44, which will result in pulling the instrument 32 along at both ends by means of gears 51.

The instrument 55 of Figs. 9 to 15 differs from the instruments of Figs. 1 to 8 in that the instrument 55 is longitudinally adjustable on a central beam or member 56 which latter projects through openings in the uprights 57 of the instrument. The openings in the uprights are of the same shape as the configuration of the beam 56 as shown in Fig. 13.

The ends of the beam 56 are each suitably secured to a guide plate 58, each plate projecting under its respective guide and holding track 59, Fig. 12. Each track 59 is suitably secured on a board or other support 60 by means of screws 61 and is provided with a central upstanding gear rack 62.

An operating shaft 63 extends the entire distance between the gear racks 62 and is rotatably mounted in bearings 64, each mounted on its

respective upright 57, Fig. 13, and bearings 65 secured by suitable means such as rivets 66, Fig. 15, to its respective plate 58 and against the side of the guide track 59. Each end of the shaft 63 has a gear 67 secured thereon to rotate with the shaft spaced from its respective bearing 65 by means of a spacing collar 68 and meshing with its respective rack 62. A knurled knob 69 is suitably secured on the shaft 63 to rotate the latter for adjustment of the instrument 55.

As seen in Fig. 13, the beam 56 bears against the base plate 70 and a clamp 71 provided with a winged nut 72, Fig. 14, locks the instrument 55 to the beam 56 in adjusted position relative to the longitudinal axis of the beam 56.

Each plate 58 is provided with a clamp 73 having a winged nut 74, the clamp 73 locking the respective plate 58 to its track 59.

As seen in Fig. 13, the guide nut 75, which adjusts the recording and indicating arm 12, is provided with a guide fork 76 to prevent rotation of the nut 75 when the latter is actuated by the spiral threaded rod 77. Such features are illustrated and described in detail in my said co-pending applications.

The lateral adjustment of the instrument of Figs. 9 to 15 is similar to the adjustment of the instrument of Figs. 4 to 6. In the instrument of Figs. 9 to 15, the instrument 55 may be adjusted longitudinally on the beam 56 by loosening the clamp 71, the shaft 63 during such adjustment sliding in the bearings 64.

The modification of Figs. 16 to 22 is similar to Figs. 9 to 15 in that Figs. 16 to 22 illustrate a plurality of instruments 78 and 79 each longitudinally adjustable and any desired number being secured to each other so that all the instruments may be adjusted laterally at one time and by the same single means, namely, shaft 63, knob 69, gears 67 and toothed racks 62. The guide plates 80 are somewhat longer so that tie bars 81 may be suitably secured thereto and each plate 80 is provided with a locking clamp 82 and winged nut 83.

In order that each instrument 78, 79 may be adjusted slightly laterally relative to its beam 56, one upright 84 of the instrument is provided with rounded edges 85, Figs. 17 and 20, with the contour of the cut-out portion, however, practically in agreement with the cross-sectional configuration of the beam 56. The other upright 86, Figs. 19 and 21, have the vertical edges 87 somewhat larger than the cross-sectional configuration of the beam 56. Also, a pair of brackets 88 are suitably secured on each base plate 70 adjacent to the upright 86, Fig. 21, and each bracket is provided with an adjusting and locking screw 89. By loosening the winged nut 72 and then rotating the screws 89, the respective instrument is adjusted to the right or left around the edges 85 as centers. In other words, the instrument is adjusted to the right or left of the beam 56 around a center in the longitudinal axis of the beam 56 at the upright 84.

If the instrument 78 is adjusted by means of the screws 89, the shaft 63 remains stationary. For this purpose the bearing opening 90, Fig. 19, in the bearing plate 91 on upright 86 is elongated horizontally, but the bearing plate 92 on the upright 84, Fig. 17, has an opening 93 which is only slightly elongated horizontally since the instrument 78 pivots around the upright 84.

The purpose of the adjustment by means of the screws 89 is to assure perfect alignment of

each instrument relative to the line to be recorded in relation to the paper or record sheet on which the recordings are made and also to align the recorded line relative to vertical coordinate lines which are printed on the record sheet.

The operation of the instruments of Figs. 16 to 22 is easily understandable from the drawings and the foregoing description. The main feature of this form of the invention is that by a single shaft 63 on one instrument, all of the instruments are adjusted simultaneously to right or left, Fig. 16.

The modification of Figs. 23 to 29 shows an instrument 95 having a single element 94 which not only acts to mount and secure the instrument 95 on the board 96 but also acts to adjust and move the instrument laterally, that is, to the right or left on the board, Fig. 23. The combined beam and shaft 94 is rotatably and slidably mounted in the uprights 97 in contact along its length with the base plate 98. A clamping device 99, Figs. 23, 25 and 27, is mounted on one end of the base plate to contact a section of the shaft 94 and is provided with a knurled knob 100 also threaded in the base plate so that upon tightening the knob 100 the instrument 95 is locked in position on the shaft 94. A pair of collars 101 is also mounted on the shaft 94, one on each end and adjacent to the ends of the base plate 98, Fig. 23. Each end of the shaft 94 is provided with gear teeth 102 thereby forming a gear, each of which meshes with a respective gear rack 103 secured to a bracket bar 104.

The bar 104, Figs. 23 and 24, is mounted along each of two opposite edges of the board 96 but a pair of bars may be mounted vertically in spaced relation instead of horizontally as shown, if desired.

Each end of the shaft 94 may be provided with a ball 105 and 106, each adapted to abut against its bracket 104 and of which ball 106 is provided with a spring 107 in case the brackets may not be exactly parallel to each other.

The actuating nut 108, Fig. 26, on the spirally-threaded actuating rod 109 is provided with a fork member 110 contacting the shaft 109 to prevent the rotation of the nut 108 similar to the structure shown in Fig. 13.

The operation of the structure of Figs. 23 to 29 is believed to be obvious from the foregoing description. If the instrument 95 is to be adjusted longitudinally on the shaft 94, the knob 100 is loosened together with the collars 101, the latter by means of the set screws 111, Fig. 25, which will permit the instrument to slide axially on the shaft 94. If the instrument is to be adjusted to the right or left, Fig. 23, it is merely necessary to loosen the knob 100 and rotate the shaft 94 by means of one of the collars 101, using for this purpose the thumb or one of the fingers of the operator. Rotation of the shaft 94 will move the

shaft and instrument 95 laterally due to the gears 102 and racks 103.

The various parts of the machine may be made of any suitable materials such as metals, alloys or plastic compositions.

Obviously, the present invention is not restricted to the particular embodiments herein shown and described. Moreover, it is not indispensable that all the features of this invention be used conjointly, since they may be employed advantageously in various combinations and sub-combinations.

I claim as my invention:

1. In combination with an indicating and recording instrument, a device for mounting and adjusting the instrument on a support comprising a pair of bars mounted in spaced relationship and parallel to each other on the support and each having a downwardly extending gear rack, a shaft rotatably secured to the instrument and having a gear on each end meshing with its respective rack, and means on each end of the shaft to rotate the shaft and move the instrument in a direction parallel to the bars.

2. In combination with an indicating and recording instrument, a device for mounting and adjusting the instrument on a support comprising a pair of bars mounted in spaced relationship and parallel to each other on the support and each having a downwardly extending gear rack, a shaft rotatably secured to the instrument and having a gear on each end meshing with its respective rack, and means on the shaft to rotate the latter and move the instrument in a direction parallel to the bars.

3. In combination with an indicating and recording instrument, a device for mounting and adjusting the instrument on a support comprising a pair of bars mounted in spaced relationship and parallel to each other on the support and each having a downwardly extending gear rack, a shaft rotatably secured to the instrument and having a gear on each end meshing with its respective rack, means on the shaft to rotate the latter and move the instrument in a direction parallel to the bars, and a ball on each end of the shaft abutting against its respective bar to facilitate movement of the instrument and shaft relative to the bars.

4. In combination with an indicating and recording instrument, a device for mounting and adjusting the instrument on a support comprising a pair of bars mounted in spaced relationship and parallel to each other on the support and each having a downwardly extending gear rack, a shaft rotatably secured to the instrument and having a gear on each end meshing with its respective rack, and a collar secured upon each end of the shaft adjacent each end of the instrument to rotate the shaft and move the instrument in a direction parallel to the bars.

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