

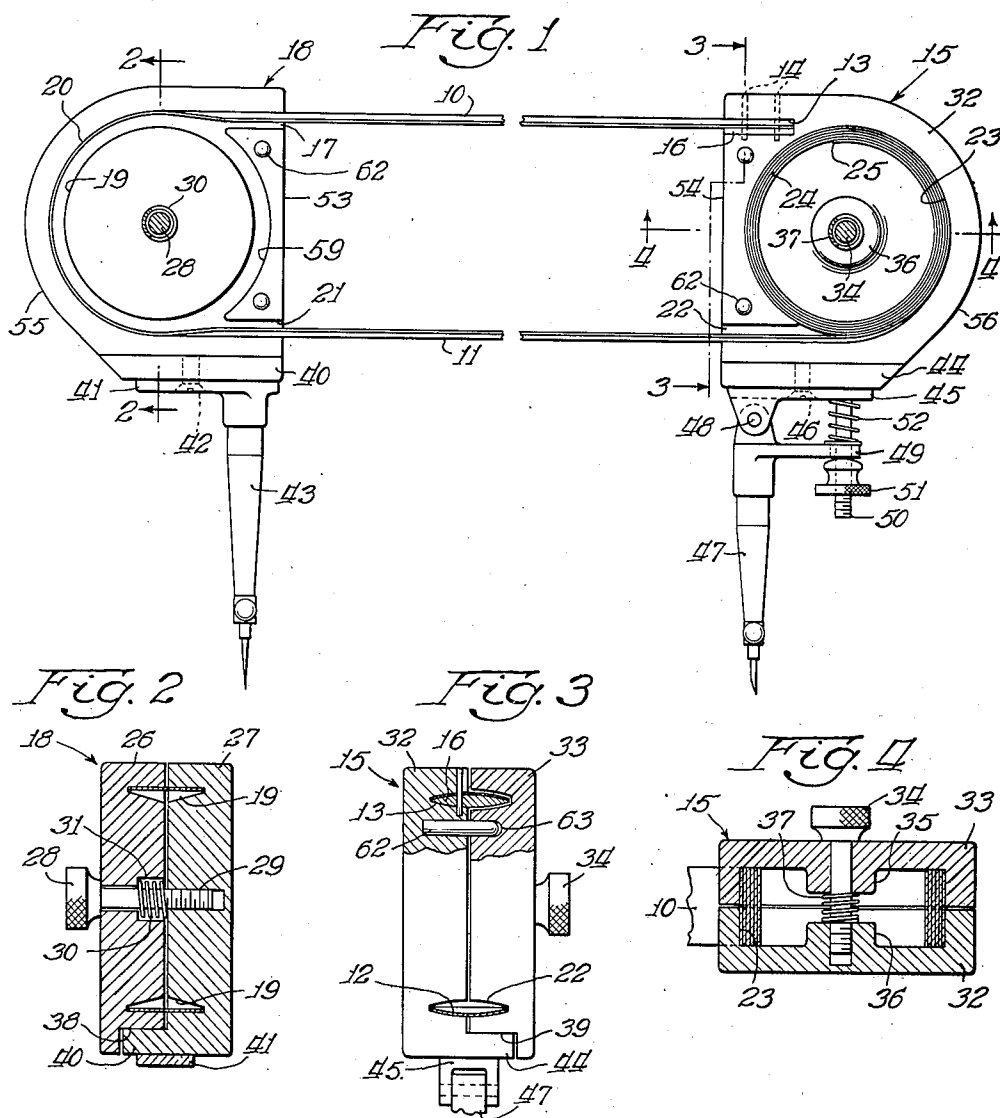
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BEAM COMPASS

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BEAM COMPASS

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1 Claim. (Cl. 33—158)

This invention relates to beam compasses and aims to provide an improved construction thereof which permits greater compactness with enhanced utility for such a device.

Other objects and advantages will be apparent from the following description, taken together with the accompanying drawing, in which—

Figure 1 is a plan view, partially in section, of a beam compass constructed in accordance with the present invention, parts being broken away for convenience;

Figure 2 is a cross-section taken on the line 2—2 of Fig. 1;

Figure 3 is a staggered cross-section looking in the opposite direction and taken on the line 3—3 of Fig. 1; and

Figure 4 is a partial longitudinal axial section taken on the line 4—4 of Fig. 1.

Referring in detail to the illustrative construction shown in the drawing and in accordance with the present invention, 10 and 11 are a pair of spring steel tapes of the kind purchasable on the market and which have a naturally arcuate cross-section, as indicated at 12. It will be understood that such tapes may be wound somewhat as on a reel and that in such winding the tapes are flattened out so as to occupy a minimum of space, the flattening permitting the winding. In this instance the tapes 10 and 11 are a continuous tape having two runs or, in other words, are continuous and integral at one end of each and together comprise a beam for the compass, the beam being extensible and retractable, as presently more particularly described.

One end of the tape 10 may be anchored in a slot 13 as by pins 14 in a box 15 which is conveniently formed of wood or, say, of a molded plastic material. A filler 16 forced into the slot 13 with the end of the tape 10 serves to effect a tight fit for the tape in the slot. The tape 10 passing in the other direction enters a slot 17 in another box 18, and passes through a semicircular groove 19 therein as at 20 to emerge through another slot 21 in the box 18 as an integral continuation, in this instance, of the second tape 11. The second tape 11 passes back into the first box 15 as through a slot 22 and into a cylindrical chamber 23 therein where it winds upon itself as at 24, having a free end 25 within the chamber at the innermost of the windings 24. Thus arranged the slots 21 and 22 in the boxes 18 and 15 respectively are tangential to the tape convolutions 20 and 24, and are elongated in the direction of the tape passing through the slots

21 and 22. The slots in the boxes serve to assist in flattening the tapes.

It will be understood that the boxes, as best shown in Figs. 2, 3 and 4, may be advantageously split perpendicular to the axes of the boxes and thus constructed in mating half-sections.

The box 18 comprises a pair of mating half-sections 26 and 27, the slots 17 and 21 being formed half in each of these mating sections, which are releasably clamped together as by a thumb-screw 28 passing through the section 26 and threaded into a tapped hole 29 in the section 27. About the shank of the thumb-screw 28 is desirably a compression coil spring 30 lying in a counterbore 31 in the box section 26, which spring normally biases the sections 26 and 27 apart, so that they are forced together by the thumb-screw 28 against the resilience of the spring 30.

Similarly, the box 15 may be formed of mating sections 32 and 33, the slots 13 and 22 being similarly formed half in each section. The box 15 may similarly have a thumb-screw 34 which passes centrally through the sections 32 and 33, which are centrally interiorly hubbed as at 35 and 36 (Fig. 4) within the chamber 23. A spring 37 serves the same function in this box 15 that the spring 30 serves in the box 18.

One of the sections of each box, in this instance the section 26 of the box 18 and the section 32 of the box 15, is undercut as at 38 and 39 respectively to permit the other section to be extended. In the case of the box 18, the section 27 is thus extended as at 40 to have secured thereto a plate 41 as by screws 42 for mounting an instrument such as the needle-point leg 43. Similarly the section 32 is extended as at 44 to have secured thereto a plate 45 as by screws 46 for mounting a drawing instrument, or, in this case, pencil leg 47. The extensions 40 and 44 also provide offset interengaging portions with the undercuts 38 and 39 respectively to prevent relative rotation of the mating sections of the boxes respectively by reason of the shoulders thus provided where the meeting plane of the sections is offset.

The pencil leg 47 may be the usual type purchasable on the market and pivoted as at 48, having an arm 49 through which passes a post 50 on which the arm 49 may be moved as by a thumb-screw 51 against the force of a spring 52 to permit of a so-called micrometer adjustment of the pencil leg 47.

It will be understood that the principal adjustment for the length of the beam compass is af-

forded, following the present disclosure, by first slightly unscrewing the thumb-screws 28 and 34 so as to release the tapes in the boxes and then pulling the boxes apart, the tapes unwinding therefrom as the boxes are moved apart, to the desired principal distance adjustment. Thereupon, the screws 28 and 34 are again tightened to fix the distance of projection of the tapes from the boxes. Because of the inherent characteristics of the tapes as beams by their arcuate cross-section, the structure is rigid for the purpose here referred to.

When the device has served its purpose for the time, the thumb-screws 28 and 34 may be released and the boxes pushed together again, at which time the tapes will be windingly received in the boxes and the thumb-screws again tightened to maintain the boxes together. For purposes of such mating, the boxes desirably have flat faces 53 and 54 along their adjacent sides, while their outer sides are appropriately rounded as at 55 and 56 to form a composite whole of pleasing appearance.

Guide pins 62 in some of the mating sections of the boxes received in recesses 63 in the opposite sections fix the box sections against rotative displacement while permitting some movement toward and from each other under the influence of the springs 39 and 37 and thumb-screws 28 and 34.

Thus, I make a novel use of the rigidity and yet windability of a steel tape of this type to act as a beam for an improved beam compass, one end of the tape carrying a drawing instrument and the other end a box or housing for changing the direction of the tape. It will be seen that no spring is required to retract the tape since the tape is not limp but is highly resilient and maintains itself against the wall 23 of the interior chamber of the box 15, the free end 25 of the tape being urged by its own resilience toward this wall without any extraneous means for this purpose and yielding only to accommodate the winding of the tape upon itself as the tape is retracted and more convolutions of the tape are received within the box. Conversely, as the tape is extended and fewer convolutions remain in the box, the free end 25 is still urged by its own resilience against the wall 23 to take up the space left by the fewer number of convolutions. Thus no reel other than the cylindrical interior of the box 15 is necessary for the winding and unwinding of the tape. Furthermore, no clamping or braking member is required in the novel arrange-

ment here shown, since the arrangement makes use for this purpose of the friction or braking action resulting when the arcuation of the tape outside of the box 15 disappears as the tape is retracted into the box and its cross-section becomes flat as in the convolutions 24. This change, as shown in Figs. 1 and 3, from an arcuate to a flat cross-section takes place in the slot 22 and where this slot merges into the chamber 23. Consequently in practice sufficient friction or braking action is thus provided so that only a minimum use of the thumb-screw 34 is necessary, and the thumb-screw 34 is not for the purpose of producing greater friction but rather so that less friction may occur in order to make it easier to push the tape into the box or to pull it therefrom, the tightening of the thumb-screw 34 being usually done when the tape is extended or retracted to nearly its fullest extent and then only as an auxiliary means supplementing the inherent braking action of the improved device.

Having described my invention, I claim:

In a beam compass comprising an extensible and retractible spring metal normally transversely arcuate tape received at one end in a box therefor and extending between relatively movable parts of the compass, that improvement therein in which the box is split perpendicularly to its axis whereby it is constructed in mating sections and has a cylindrical chamber having a plain wall therein formed jointly by said mating sections receiving a free unconnected end of the tape in convolutions of flattened cross-section, the natural resilience of the tape urging said free end toward the wall of said chamber and said free end moving toward or from said wall as the tape is extended or retracted and the number of convolutions in the chamber is diminished or increased, the box having a tangential slot therein materially elongated in the longitudinal direction of the tape for the passage of the tape from said chamber and the tape where passing therethrough changing from an arcuate to a flattened cross-section whereby friction is produced which restrains outward movement of the tape unless positively actuated, and in which a thumb-screw passes through the mating sections centrally of said chamber to retain said mating sections adjustably together and offset interengaging portions are provided on the mating sections to prevent relative rotation of said sections, one of said offset portions providing securing means for a compass part.

HAROLD L. DE LISLE.