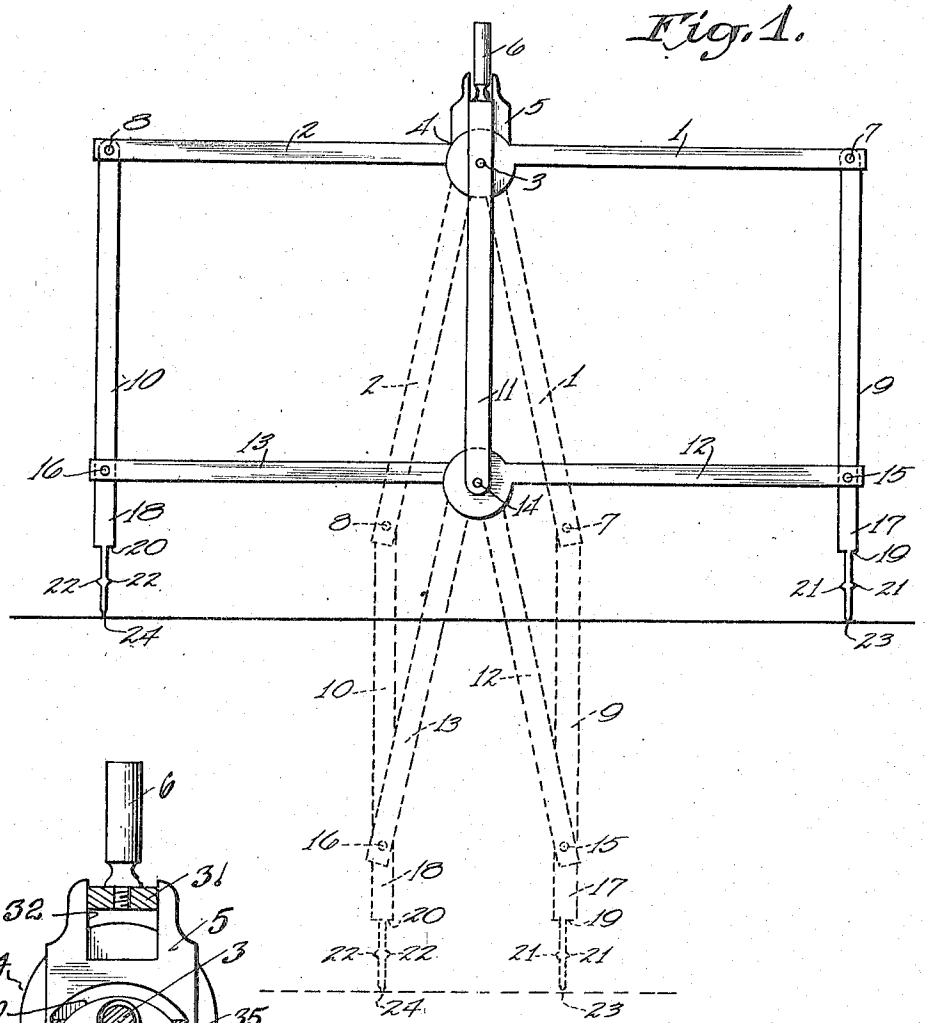
Nov. 18, 1924. 1,515,943

J. R. ENGERS

SELF ADJUSTING BOW DIVIDERS

Filed March 31 . 1921

Fig. 1.



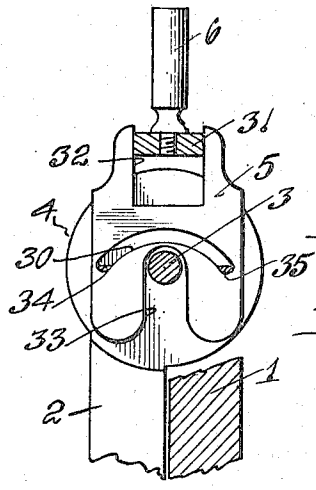


Fig. 2.

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SELF-ADJUSTING BOW DIVIDERS.

Application filed March 31, 1921. Serial No. 457,393.

To all whom it may concern:

Be it known that I, JOSEPH R. ENGERS, a citizen of the United States, and a resident of Akron, in the county of Summit and State of Ohio, have invented a new and useful Improvement in Self-Adjusting Bow Dividers, of which the following is a full, clear, and exact description.

My invention relates to measuring instruments, and it consists in the combinations, constructions and arrangements herein described and claimed.

An object of my invention is to provide a bow divider that is self adjusting in that the legs thereof will always remain in parallelism and perpendicular to a line drawn between the ends thereof.

A further object of my invention is to provide in a single device means for performing the functions ordinarily requiring the use of a plurality of separate tools.

A further object of my invention is to provide a combination tool of the type described that is capable of use as inside calipers, outside calipers, hermaphrodite calipers and as dividers or compasses.

A further object of my invention is to provide a device of the type described that is relatively simple in construction and operation, not likely to get out of order easily, and thoroughly practical commercially.

Other objects and advantages will appear in the following specification, and the novel features of the invention will be particularly pointed out in the appended claims.

My invention is illustrated in the accompanying drawings, forming part of this application, in which—

Figure 1 is a view in elevation of a device embodying my invention, and Figure 2 is an enlarged view partly in section of the equalizing mechanism.

In carrying out my invention, I provide a pair of identical arms 1 and 2 pivotally joined to one another at 3, their adjacent end portions being enlarged and curved as indicated at 4 for engagement with an angle equalizing member 5 that is ordinary in construction and is mounted on a handle 6. The angle equalizing member automatically maintains the handle 6 in position to bisect the angle supplementary to the angle subtended between the arms 1 and 2.

In Figure 2 I have illustrated the equalizing member 5. This member consists in a leaf, substantially as shown in the figure, having an arcuate groove 30 therein. This leaf 5 arranged to straddle the handle supporting member 31, as shown at 32, and has a recess 33 in its lower edge to clear the pivotal joint 3 of the arms 1 and 2. The arm 2 is provided with an inwardly extending lug 34 which is partially received in the slot 30. The arm 1 is provided with a lug 35 also partially received in the slot 30. These lugs 34 and 35 are somewhat circular in cross section and are diametrically opposed from one another when the legs 1 and 2 are in the position shown in Figure 2 when the device is closed. When the arms 1 and 2 are open to their full extent, as shown in Figure 1, the lugs 34 and 35 contact with one another. It is essential that the arcuate slot 30 be constructed with a greater radius than the radius between the center pivotal point 3 and the peripheral edge of the curved portion 4 of the legs 1 and 2. This structure causes the leaf 5 to be elevated as the legs 1 and 2 are moved apart from one another and at all times the leaf assumes and maintains a definite relation to the lugs 34 and 35, which relation causes the leaf 5 at all times to lie in a plane bisecting the adjacent sides of the legs 1 and 2. Since the leaf 5 assumes this position, it is apparent that the supporting member 31 and the handle 36 will also assume the same position, since these members are held in position by the leaf 5.

Pivoted at 7 and 8, respectively, to the arms 1 and 2 at the remote ends thereof are precisely identical branches or legs 9 and 10. The handle 6 is formed with an integral longitudinal extension 11 to its lower end and obviously this extension will automatically be maintained in position to bisect the angle subtended by the arms 1 and 2. Auxiliary arms 12 and 13, which are identical with one another and with the arms 1 and 2 in essential respects, connect the branches or legs 9 and 10, respectively, with the extension 11 so that the auxiliary arm 12 is parallel with the arm 1 and the auxiliary arm 13 is parallel with the arm 2. The auxiliary arm 12 has a pivotal connection at 14 with the extension 11 and a pivotal connection at 15 with the branch or leg 9, the distance between the points of connection 14 and 15 being equal to the distance between the points of connection 3 and 7 of the arm 1 so that the distance between the points 3

and 14 is equal to the distance between the points 7 and 15 and the branch or leg 9 will always be parallel with the extension 11. Similarly, the auxiliary arm 13 has pivotal connections at 14 and 16 with the extension 11 and the branch or leg 10, respectively, so that the latter will always be parallel with the extension 11 and therefore with the branch or leg 9.

From the foregoing description of the various parts of the device, the operation thereof may be readily understood. It will be observed that the arms 1 and 2 and the branches or legs 9 and 10 are straight members. The legs 9 and 10 extend below the points of connection with the auxiliary arms 12 and 13, the integral lower portions 17 and 18 being equal in length. The portions 17 and 18 may be formed to render the device embodying my invention capable of various uses. In the present instance, the portions 17 and 18 have been reduced at corresponding points as at 19 and 20, respectively, and each is provided with like diametrically opposed contact points 21—21 and 22—22 and may have the tips thereof tapering to points as at 23 and 24. The contact points 21—21 are alined with the contact points 22—22. Since the legs 9 and 10 are parallel with each other and with the extension 11 to the handle 6, they will always be perpendicular to a line drawn between the tips 23 and 24 and need not be moved into perpendicular positions when the device is used as dividers, as is necessary when ordinary dividers are used. The device therefore provides a means with which a draftsman or mechanic can do work more quickly and accurately than is usual when the ordinary instruments are used.

The device illustrated embodies the contact points 21—21 and 22—22 and obviously can therefore be used in performing the work ordinarily requiring the use of a plurality of separate instruments, such as inside calipers, outside calipers, hermaphrodite calipers, and trammels.

Obviously, many modifications and adaptations of the form of the device shown and described herein can be provided and I therefore consider as my own all modifications and adaptations of the device that fall within the spirit and scope of the invention as disclosed in the foregoing specification and outlined in the appended claims.

I claim:

1. A combination tool comprising a handle, a pair of straight legs, each being formed at one end to provide a point and with diametrically opposed laterally extending contact points at a spaced distance from the pointed extremity thereof, and means connecting the legs with the handle for maintaining the legs parallel with each other and with the handle and perpendicular to a line drawn between the pointed ends of said legs.

2. A device of the character described comprising an elongated handle having an extension extending longitudinally thereof, a pair of arms pivotally connected at one end and joined to said handle at their point of connection with one another, a pair of straight legs pivoted to the arms at the remote ends thereof, each leg being formed with its free end adapted to engage work, means carried by said handle and engaging with said arms for equalizing the angles between said handle and said arms respectively, and auxiliary arms disposed parallel with said first named arms, one of said auxiliary arms having a pivotal connection with one of said legs at a spaced distance from the free end thereof and a pivotal connection with the extension to the handle and the other of said auxiliary arms having a pivotal connection with the other of said legs at an equal distance from the free end thereof and also having a pivotal connection with the extension to the handle, whereby the legs are maintained parallel with each other and with the extension.

JOSEPH ROLLIN ENGERS.