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COMBINATION CALIPER, DIVIDER AND COMPASS

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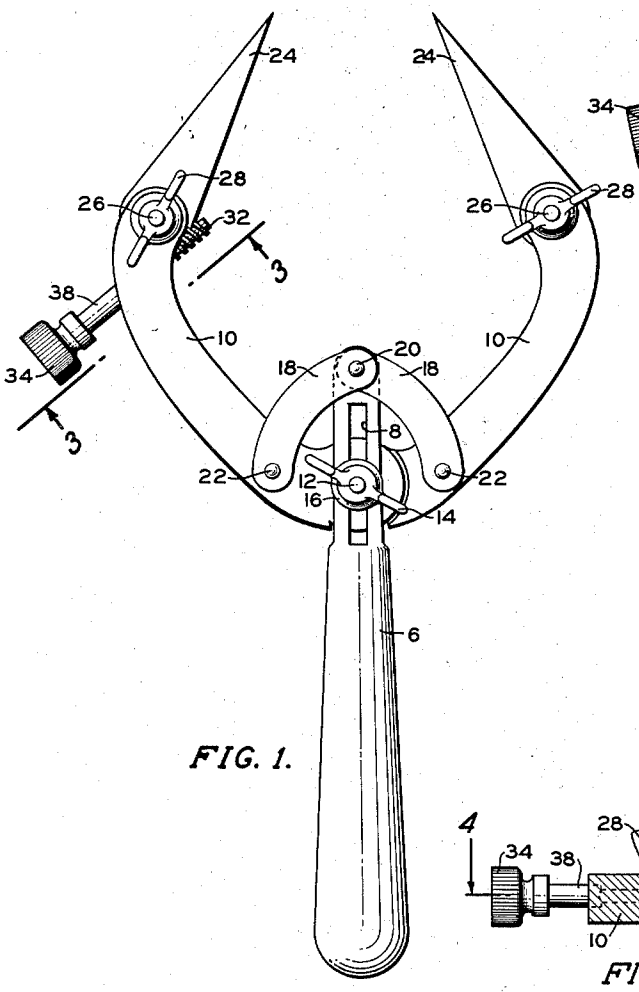


FIG. 1.

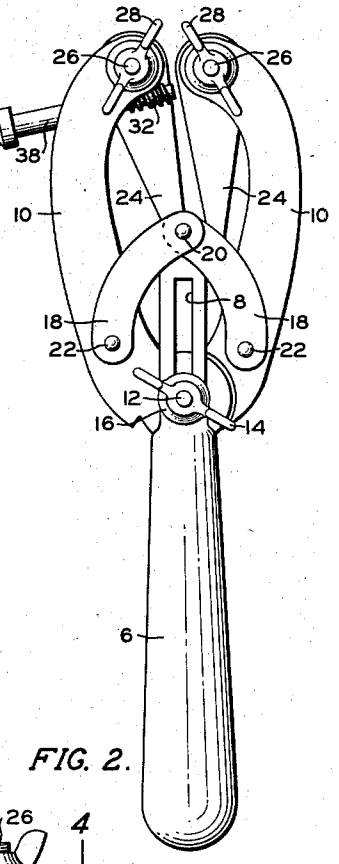


FIG. 2.

FIG. 3.

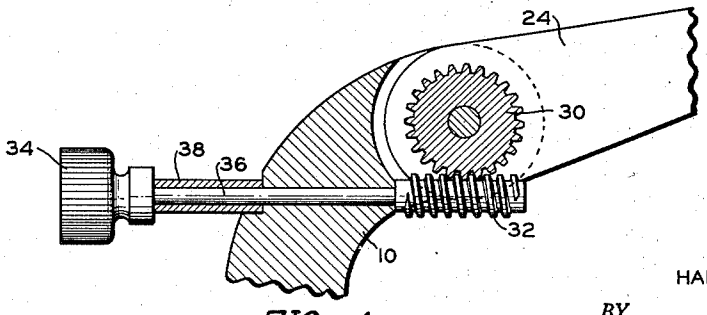


FIG. 4.

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COMBINATION CALIPER, DIVIDER AND COMPASS

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3 Claims. (Cl. 33—157)

This invention relates to new instrument means, particularly instrument means to measure the distance between two points, measure off a series of equidistant points and mark off a circle or arc of a circle of desired radius. In a more specific aspect, this invention relates to a combination caliper, divider and compass.

Compasses, dividers and calipers are known in the art, and devices which will perform more than one of the functions of these different instruments are known. However, for numerous reasons the instruments known in the art are not at all suitable for use by workmen on the job, for example, on the assembly line of a manufacturing plant, in the shops, in a refinery or chemical plant, etc. The prior art instruments which have compass and divider features are primarily for use in drafting operations. The instruments of the prior art will not perform all the functions desired by the field, plant or shop workmen; they are not safe; and they either cannot be used in all the desired operations or are very inconvenient to use. I have overcome the disadvantages of the prior art instruments with the new instrument of my invention, and an instrument like that of my invention has long been needed in the art.

I have invented new instrument means, namely a combination caliper, divider and compass. The new instrument means of my invention has a pair of leg members pivotally connected to open and close together upon the movement of either leg member, and means are provided to hold the leg members in desired position for use or storage. A separate pointed foot member is pivotally attached to each leg member, and means are provided to hold the foot members in desired position relative to said leg members. The foot member on each leg is mounted so that it can pivot inwardly within the confines of the leg members whereby the pointed portion of the foot member is shielded. In a preferred specific embodiment of my new instrument one of the foot members is mounted on a leg so that it is adjustable mechanically, and a preferred specific mounting of mine so that the leg members pivot together has been found very advantageous.

The new instrument of my invention has many advantages. It is very adjustable and can be used in any and all places required by the workmen in the field, plant or shop, both of its leg members opening and closing together upon the movement of either leg member, and it has been found that in use one of the legs can always be reached. The new instrument of my invention is very safe, because my construction provides for shielding the pointed portions of the foot members with the leg members when the instrument is not in use. A workman can easily and safely carry it in his pocket. My new instrument folds up to take up little storage space, and it is strong structurally and easy and economical to manufacture.

It is an object of this invention to provide new instrument means.

It is another object of this invention to provide a new combination instrument which serves as a compass, divider and caliper.

Still another object of this invention is to provide a

combination divider, caliper, and compass for use particularly by the workman in the shop, manufacturing plant or field, such being versatile and convenient to use, safe to carry and structurally strong.

Other objects and advantages of my invention will become apparent to one skilled in the art upon reading this disclosure.

Drawings accompany and are a part of this disclosure. Such drawings depict preferred specific embodiments of the new instrument means of my invention, and it is to be understood that such are not to unduly limit the scope of my invention.

In the drawings, Fig. 1 is an elevation view of a preferred specific embodiment of the new instrument of my invention in an open use position.

Fig. 2 is an elevation view of the instrument of Fig. 1 in a closed, carrying or storing position.

Fig. 3 is a cross sectional view taken on line 3—3 of Fig. 1.

Fig. 4 is an enlarged view of preferred mechanical adjusting means for positioning one of the foot members of the instrument.

Following is a discussion and description of my invention made with reference to the drawings whereon the same reference numerals are used to indicate the same parts or structure. The discussion and description is of preferred specific embodiments, and it is to be understood that such is not to unduly limit the scope of my invention.

The embodiment of the new instrument of my invention shown in the drawings has a handle 6 with a slot 8 between the end portions thereof and preferably in the inner end portion of the handle so that a firm grip on the instrument can be had and so that remote places can be reached for measurement, etc. A pair of leg members 10 are pivotally connected together in their inner end portions by bolt 12 and wing nut 14. A washer 16 can be used, if desired. Bolt 12 passes through slot 8 and slidably mounts legs 10 in relation to slot 8 so that legs 10 are adjustable as to their open and closed position, and nut 14 when tightened holds the legs 10 firmly in desired position. The inner end portion of handle 6 pivotally mounts like brace and linking members 18 at pivot point 20. These members 18 brace the instrument and provide the linking means so that legs 10 open and close together upon the movement of either of members 10 with bolt 12 and nut 14 relatively loose. Members 18 are pivotally mounted on legs 10 at points 22.

The outer end portions of legs 10 mount foot members 24. These foot members are preferably pointed in their outer end portions, and they are pivotally mounted by bolts 26 and wing nuts 28 so that they are adjustable. For example, with legs 10 open as in Fig. 1, the instrument can be used as a caliper or as a divider with the sharp points of foot members 24 contacting the surface in question, or a circle or arc of the radius between the points of members 24 can be measured out; and with the legs 10 closed more than in Fig. 1, members 24 can overlap to make small measurements of for instance the inside of a pipe. With foot members 24 pivoted outwardly large inside measurements can be made. A common rule or other calibrated measuring device can easily be used to obtain the units of distance measured by my instrument, or such a rule can be used to establish on my instrument the distance desired between the equidistant points or the radius of the arc or circle. Fig. 2 shows the instrument with foot members 24 pivoted inwardly completely so that legs 10 shield the points of members 24. This makes the instrument very safe to store or carry in the pocket or

otherwise. As shown in the drawings (Fig. 3), the legs 10 and foot members 24 are constructed so that when the foot members are folded inwardly (Fig. 2), the points of the feet 24 fall within the space formed by the inner edges of legs 10, a plane tangent to legs 10 on one side thereof, and an opposed plane tangent to the legs 10 on the other side thereof and spaced from the first plane in parallel relation thereto.

I prefer to make one of the foot members 24 adjustable mechanically so that more accurate setting of the instrument can be accomplished, and so that it can be operated efficiently without touching the legs 10, if such is desired. To accomplish this, I mount a worm wheel 30 on a member 24 to turn therewith, and a corresponding endless screw 32 with an operating head portion 34 is mounted by its shank 36 in leg 10. A sleeve bearing 38 around the projecting portion of shank 36 has been found desirable. And these worm gear means to position foot 24 have been found very desirable and efficient. Wing nut 28 and bolt 26 can be used in conjunction with the worm gear means to further firmly hold foot 24 in desired position, or the worm gear means can be used alone.

The new instrument of my invention can be made of any suitable material, preferably steel. Handle 6 can be eliminated, if desired, that is, using just the slotted portion thereof to slidably mount legs 10, and the inner end portion thereof to pivotally mount linking members 18. However, I have found the new instrument of my invention to be much more versatile with a handle 6 substantially as shown.

As will be evident to those skilled in the art, various modifications of my invention can be made, or followed, in the light of this disclosure and discussion, without departing from the spirit or scope of the disclosure or from the scope of the claims.

I claim:

1. A combination inside and outside caliper, divider and compass, comprising, in combination, a handle member, a longitudinal slot in a portion of said handle member between the end portions thereof, a pair of oppositely disposed leg members pivotally connected together in their inner end portions by bolt and nut means, said bolt means passing through said slot to movably mount said leg members on said handle member and said nut means being adapted to firmly maintain said leg members in desired position relative to said slot, a pair of brace and linking members oppositely mounted with their inner end portions pivotally connected to each other and the inner end portion of said handle member and their outer end portions oppositely connected to said leg members so that said leg members open and close together upon movement of either, a first foot member having a pointed outer end portion pivotally and adjustably mounted in its inner end portion on the outer end portion of one of said leg members by bolt and nut means, said bolt and nut means being adapted to firmly hold said foot member in desired position, a second foot member having a pointed outer end portion and a worm wheel mounted on its inner end portion, said inner end portion of said second foot member pivotally mounted by bolt and nut means on the outer end portion of the other of said leg members, said last mentioned bolt and nut means adapted to firmly maintain said second foot member in desired position, and an endless screw having a finger grip on its outer end portion mounted on said last-named leg member, said screw and worm wheel adapted to position said last-named foot member, and said foot members and legs being of size and shape and constructed to permit said foot members to be pivoted inwardly to the extent that the points of said foot members point toward said handle member so that when said foot members are so pivoted inwardly said points of said foot members lie within a space formed by the inner edges of said leg members, a plane tangent to both leg members on one side thereof and an opposed plane tangent to both leg members on the opposite side thereof, said planes being spaced and parallel.

2. A combination inside and outside caliper, divider and compass, comprising, in combination, a slotted connecting member, a pair of leg members pivotally mounted in their inner end portions to pivot means mounted in the slot of said connecting member, a first linking member having one end portion pivotally connected to an end portion of said slotted member and the other end portion pivotally connected to one of said leg members, a second linking member having one end portion pivotally connected to said end portion of said slotted member and the other end portion pivotally connected to the other of said leg members so that said legs open and close together upon the movement of either, means to hold said legs in desired position, each of said leg members having a pointed foot member pivotally connected thereto, one of said leg and foot members having worm gear means therewith to adjust said foot member, and means to hold said foot members in desired position, said foot members and leg members being of size and shape and constructed to permit said foot members to be pivoted inwardly to the extent that the points of said foot members point toward said connecting member so that when said foot members are so pivoted inwardly said points of said foot members lie within a space formed by the inner edges of said leg members, a plane tangent to both leg members of one side thereof and an opposed plane tangent to both leg members on the opposite side thereof, said planes being spaced and parallel.

3. A combination inside and outside caliper, divider and compass, comprising, in combination, a slotted connecting member, a pair of leg members pivotally mounted in their inner end portions to pivot means mounted in the slot of said connecting member, a first linking member having one end portion pivotally connected to an end portion of said slotted member and the other end portion pivotally connected to one of said leg members, a second linking member having one end portion pivotally connected to said end portion of said slotted member and the other end portion pivotally connected to the other of said leg members so that said legs open and close together upon the movement of either, means to hold said legs in desired position, each of said leg members having a pointed foot member pivotally connected thereto, one of said leg and foot members having gearing therewith to adjust said foot member, and means to hold said foot members in desired position, said foot members and leg members being of size and shape and constructed to permit said foot members to be pivoted inwardly to the extent that the points of said foot members point toward said connecting member so that when said foot members are so pivoted inwardly said points of said foot members lie within a space formed by the inner edges of said leg members, a plane tangent to both leg members on one side thereof and an opposed plane tangent to both leg members on the opposite side thereof, said planes being spaced and parallel.

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