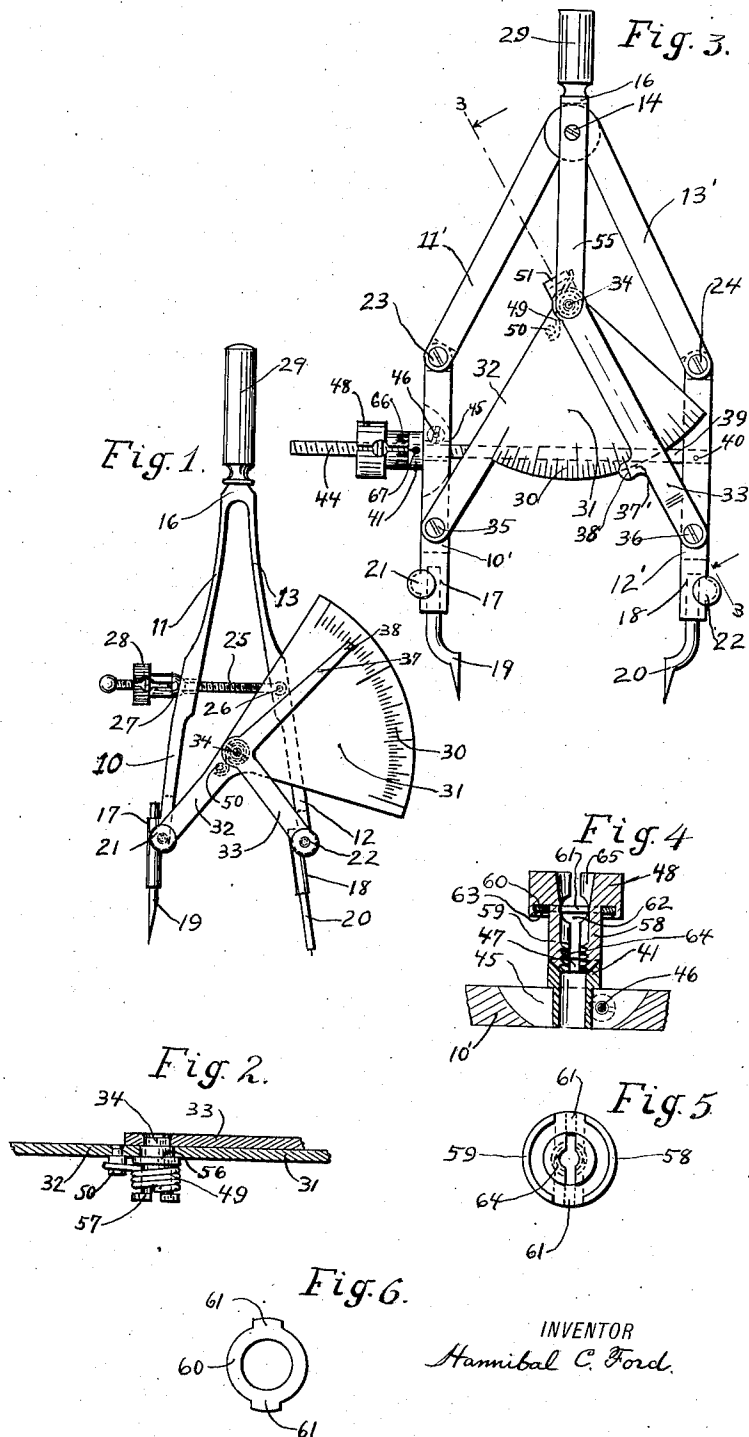


964,962.

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COMPASSES.
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WITNESSES:
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COMPASSES.

964,962.

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To all whom it may concern:

Be it known that I, HANNIBAL CHOATE FORD, a citizen of the United States, residing at Syracuse, in the county of Onondaga and State of New York, have invented certain new and useful Improvements in Compasses, of which the following is a specification.

This invention relates to compasses or dividers adapted for drawing circles or making measurements, and has for its objects, first; to produce an instrument of this character which may be set with rapidity in position for accurately laying out a given radius or dimension, without the use of a separate scale; and second, to provide an instrument which may be economically manufactured, conveniently used, and in which the required degree of accuracy may be maintained. For this purpose I provide a graduated scale which forms part of the instrument and on which the movements of the legs are automatically registered or indicated.

An additional feature of the invention consists in a quick adjustment or spring nut which I employ in the place of a solid nut on the usual adjustment screw. My invention further consists in the features of construction and combination as hereinafter set forth and claimed.

In the drawings: Figure 1 is a side elevation of a pair of compasses or dividers embodying the principles of my invention. Fig. 2 is a detail sectional view of a hinge-joint employed in the construction. Fig. 3 is a view similar to Fig. 1 showing a modified construction. Fig. 4 is a sectional view of an adjustment nut employed in the construction of Fig. 3. Fig. 5 is an underside view of the same. Fig. 6 shows a washer provided in the construction of the spring nut.

Referring to the drawings, 10 and 12 designate the legs of a pair of compasses or dividers supported from a connecting yoke 16 and handle 29. I have illustrated legs formed with flexible portions 11 and 13 by which their movement toward and from one another is provided for. The springiness of these flexible portions of the legs is adapted to constantly tension the legs toward their utmost limit of separation, and means are provided for forcibly contracting the legs toward one another for making the com-

pass settings. For this purpose I have illustrated a hinged screw rod 25 pivoted at 26 to the leg 12 and having a nut 28 at the free end, this nut working against the free compass leg 10. The screw rod 25 is shown extended through an opening in the leg 10 which I provide with a ball-shaped depression in which is received a hemispherical cup 27. The nut 28 has a rounded end working in the concave face of the cup 27. Each compass leg has a socket at its bottom end, denoted 17 and 18 respectively, and in which may be received the lead 19 and steel point 20 or any equivalent devices. These features, as thus far described, are of the ordinary sort employed in compasses and dividers, and may be of any desired sort, forming in effect no particular part of my present invention.

31 denotes a plate having a graduated scale 30, the graduating lines whereof are preferably of varying size or length, to facilitate the rapid reading of the scale, said scale preferably having an extension 32 pivoted to one of the compass legs 10 at the point 21. 33 denotes another arm pivoted to the other compass leg at 22 and hinged or pivoted to the plate 31 by a stud 34.

37 denotes an arm or pointer rigid with and preferably forming part of the arm 33 and directed so as to move over the scale divisions 30 as the compass legs are drawn together and separated through their normal range of adjustment.

The separation of the compass legs with the instrument arranged as above described, produces a relative angular movement between the arms 32 and 33, the amount of which movement is indicated by the displacement of the pointer 37 over the divisions 30. It is evident that the divisions may be so located as to represent or show the separation of the compass legs in inches or any other unit measure. If desired, the end of the pointer 37 may be provided with a small vernier 38 to facilitate accurate settings.

In order to avoid any inaccuracy by reason of lost motion, I prefer to make use of a spring hinge at the stud 34, such for example as shown in Fig. 2. The stud 34 is secured to the arm 33 in this case and has a loose engagement with the plate 31.

57 denotes an extending portion of the stud on which is wrapped a spiral spring 49

anchored to said stud at one end and having its other end secured about a fixed stud 50 on the plate 31. The arrangement of the spring 49 is such as to throw all movable connections of the compass under tension, thereby taking up all slack or lost motion therein.

In Fig. 3 a slightly modified arrangement is shown, the principal difference being that in place of legs 10 and 12 having a spring connection with the yoke 16, separate links 11' and 13' are pivoted to the yoke 16 at the point 14 and hinged to the legs 10' and 12' at the points 23, 24. Also in place of a screw rod 25 I have shown a screw rod 39 preferably pivoted to the leg 12' at 40 and extended through a disk 41 hinged to the leg 10' at the point 46. The spring nut in this case denoted 48, has divisions 66 thereon which may be registered with an index mark 67 on the disk 41 against which the nut 48 bears at the beveled face 47. These divisions may represent any desired micrometer scale or unit depending on the thread of the screw rod 39. With this arrangement the movement of the legs 10' and 12' should be guided in parallelism.

55 denotes an extension of the handle 29 and yoke 16. This arm 55 has a pivot connection at 34 with the arms 32 and 33, so as to form a pair of parallel motions. The arms 32 and 33 are generally similar to the parts correspondingly denominated in Fig. 1, except that the segmental scale is brought into substantial alinement with the normal arc of movement of the arm 33, so that the index mark 38 may be located directly on said arm 33 or on a lateral extension 37' therefrom.

In Figs. 4, 5 and 6, I have illustrated the details of the spring nut 48. Substantially the same construction is employed in the spring nut of the compasses shown in Fig. 1. The nut 48 is longitudinally split in two halves 58, 59, and has an annular groove 63 in which is received a washer 60 of thin springy material. The edges of the nut are peened over about the washer so as to tightly engage the same. In the plane of the split or division of the nut the washer is laterally extended at each side at 61, which makes it stiffer against bending and also assists in maintaining the proper separation of the sections of the split nut. The inner ends of the split nut have the usual internal threads 64, and the outer portions 65 project sufficiently beyond the plane of the washer 60 to enable them to be pinched together and

the threaded parts 64 separated away from the screw rod 44.

What I claim, is:—

1. In a pair of compasses or dividers, legs adjustable to approach and separate from one another, a pair of cooperating arms respectively pivoted to said legs, one arm being expanded into arcuate form and having a graduated scale and the other arm having an index or pointer moving over said scale with a magnified movement when the legs are adjusted toward and from one another.

2. In a pair of compasses or dividers, legs adjustable to approach and separate from one another, means indicating the separation of the legs, and a quick adjustment nut comprising two halves with an interior groove and a spring washer seated in said groove and tightly held therein by the peened over edges of the groove, said washer having lateral extensions on each side projecting between the halves of the nut.

3. In a pair of compasses or dividers, legs adjustable to approach and separate from one another, and a pair of cooperating arms respectively pivoted to said legs, one arm having secured thereto a graduated scale of arcuate form and the other arm having an indexing portion movable over said scale to indicate the separation of the legs.

4. In a pair of compasses or dividers, legs adjustable to approach and separate from one another, means comprising a pair of pivoted arms, and a graduated scale of arcuate form carried by one of said arms, the other arm having an indexing portion movable over said scale to indicate the separation of the legs in unit measure, and a device for effecting the movement of said legs comprising a threaded member and quick adjustment nut cooperating therewith, whereby the parts may be first quickly and approximately adjusted and then by means of the arcuate scale, accurately positioned.

5. In a pair of compasses or dividers, legs adjustable to approach and separate from one another, an arm pivoted to each leg and displaceable thereby, a graduated arcuate scale carried by one of said arms, said scale being of greater radius than the arm proper, and a cooperating pointer carried by the other arm for indicating in unit measure the movement between the legs.

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Witnesses:

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