

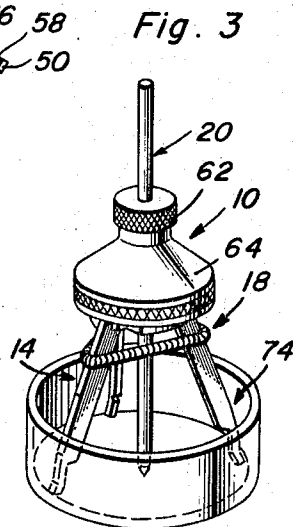
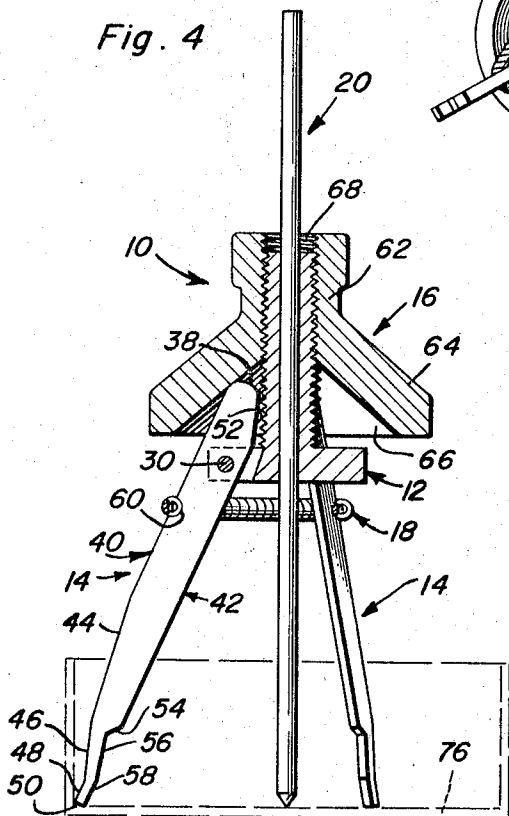
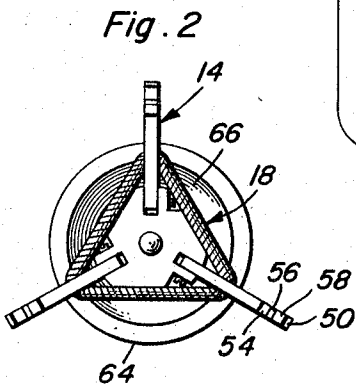
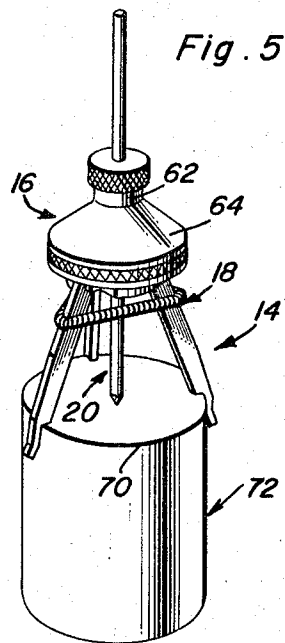
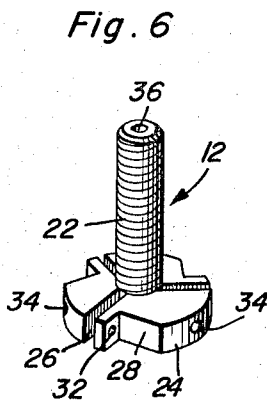
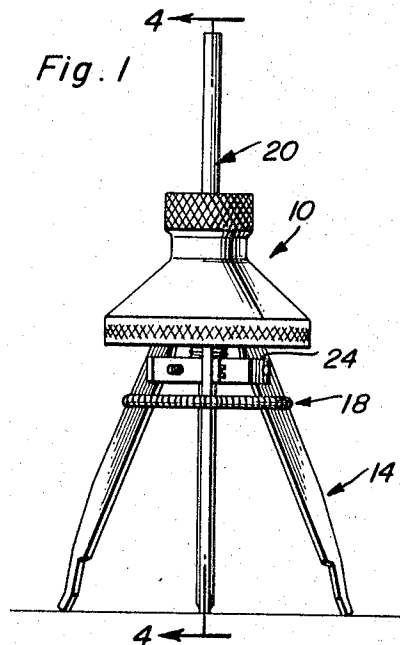
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CENTER LOCATOR

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3,318,010

CENTER LOCATOR

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The instant invention is generally concerned with a device for locating the center of objects, and more particularly relates to a device which can be accommodated to both outside peripheries, such as would be involved with solid cylinders, or inside peripheries, such as would be involved with hollow cylinders or enlarged bores.

Accordingly, it is a primary object of the instant invention to provide a center locator which is equally adaptable to both inside and outside peripheries.

In conjunction with the above object, it is also a significant object of the instant invention to provide a center locator which includes only a few parts with these parts being simply interconnected for operation in a precise and trouble-free manner.

Another object of the instant invention is to provide a center locator wherein provision is made for accommodating a punch tool so as to provide an exact indication of the located center.

In addition, it is an object of the instant invention to provide a device which, although of relatively simple construction, is of a highly rugged nature.

Basically, in achieving the above objects, it is contemplated that the center locator of the instant invention include a mounting member which, through an enlarged head on one end thereof, pivotally mounts a plurality, normally three, of elongated legs which in turn are selectively and equally spread for engagement with the periphery of the object centered by an adjusting member or bell. Further, a tension member encircles the legs and resiliently resists the spreading thereof so as to maintain the equality of the spread and ensure a proper engagement with the object, this being in addition to drawing the legs closer together as the adjusting member is backed off. Finally, both the mounting member and the adjusting member are provided with coaxial passages in alignment with the common center of the legs, and thereby the center of any object spanned by the legs, these coaxial passages accommodating an elongated punch which is utilized to provide an indication on the object itself at the center thereof.

These together with other objects and advantages which will become subsequently apparent reside in the details of construction and operation as more fully hereinafter described and claimed, reference being had to the accompanying drawings forming a part hereof, wherein like numerals refer to like parts throughout, and in which:

FIGURE 1 is an elevational view of the center locator of the instant invention;

FIGURE 2 is a bottom plan view of the device;

FIGURE 3 is a reduced perspective of the device being utilized in conjunction with an inside periphery of a cylindrical opening or bore in an object;

FIGURE 4 is an enlarged cross-sectional view taken substantially on a plane passing along line 4—4 in FIGURE 1 with the object of FIGURE 3 being shown in phantom line;

FIGURE 5 is a reduced perspective of the device mounted about the outside periphery of a solid cylindrical member; and

FIGURE 6 is an enlarged perspective view of the mounting member of the device.

Referring now more specifically to the drawings, reference numeral 10 is used to indicate the center locator comprising the instant invention. This locator 10 consists

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basically of a central mounting member 12, periphery contacting legs 14, an adjusting member or bell 16, an endless leg-encircling resilient tension member 18, and an elongated center punch 20.

The mounting member 12 consists of an elongated threaded shank 22 having a laterally enlarged circular head 24 at the first or lower end thereof, the shank 22 and head 24 preferably being integrally formed. The cylindrical or circular head 24 is provided with three radially extending leg-mounting slots 26 equally spaced thereabout and terminating, at the inner ends thereof, approximately at the shank 22. In addition, a right angular notch 28 is associated with each leg recess 26 so as to enable the insertion of a pivot pin 30 transversely across the recess 22 and engaged in a pair of holes 32 and 34 on opposite sides of the recess 26, the pin 30 normally being threaded in at least the far hole 34. Finally, both the shank 22 and the head 24 include a centrally located longitudinally extending passage 36 therethrough for the accommodation of the center punch 20, the tolerance between the passage 36 and the elongated rod-like punch 20 being such so as to allow for a free sliding of the punch 20 therethrough while precluding any lateral deflection thereof, the length of the passage 36 being particularly helpful in ensuring a true projection of the punch 20.

Each of the legs 14 consists of a relatively wide member engageable within one of the recesses 36 and pivotally mounted, below the convex upper or inner end 38 thereof, on the corresponding pivot pin 30. The inner and outer edges 40 and 42 of each of the legs 14 are generally parallel to each other with the outer edge 40, a substantial distance downward from the convex upper end 38, terminating in a portion 44 angled inwardly at a slight degree, this portion 44 in turn terminating in a shorter further inwardly angled portion 46 which in turn terminates in a relatively short terminal portion 48 extending substantially parallel to the main portion of the edge 40 and continuing to the extreme lower or outer end 50 of the leg. The inner edge 42 includes an outwardly angled upper portion 52 extending from the major parallel portion thereof to the convex upper end 38 so as to allow for a relatively greater swinging or pivotal movement to the leg 14 as shall be described presently. The lower portion of the parallel section of the inner edge 42 terminates in a sharply inclined outwardly extending portion 54 forming in effect a support shoulder. This shoulder 54 in turn terminates in a portion 56 which generally parallels the portion 46 and which in turn terminates in a portion 58 generally paralleling the portion 48 and continuing to the lower end 50 of the corresponding leg 14. Incidentally, if so desired, each of the legs 14 can include one or more longitudinally spaced pivot pin receiving holes so as to vary the extension of the legs 14 longitudinally beyond the mounting member 12, thereby in turn varying the lateral throw of the legs.

The lower or outer ends 50 of the legs 14, the major portion of the legs 14 projecting generally longitudinally from the head end of the mounting member 12, are resiliently and equally biased inwardly toward each other and a common center by a resilient biasing member generally in the nature of a coiled tension spring 18 engaged about the legs 14 just outward of the head 24 and positioned within aligning grooves 60, one in the outer edge 40 of each of the legs 14.

The outer ends 50 of the legs 14 are progressively and equally moved outward against the biasing force of the spring 18 by the adjusting member or cap 16. This member 16 includes a cylindrical upper portion 62 terminating in an outwardly flared lower portion 64 with a knurled gripping surface being provided circumferentially about both the upper end of the member 16 and the flared en-

larged lower end thereof. The flared lower portion 64 defines a tapered, and more specifically conical, inner surface 66 against which the outer portion of each of the convex upper ends 38 of the legs 14 bears. In this manner, it will be appreciated that as the adjusting member or bell 16 is raised and lowered, the upper ends 38 of the legs 14 will be either moved inwardly against the biasing force of the spring 18, or allowed to move outwardly because of this biasing force, thereby in turn adjusting the position of the lower portions of the legs 14. The vertical adjustment of the adjusting member 16 on the shank 22 is achieved through the provision of an internally threaded centrally located passage 68 through the cylindrical portion 62 of the member 16 and into communication with the conical interior 66 of the flared portion 64, this threaded passage 68 being threadedly engaged with the threaded shank 22 with the vertical adjustment being achieved by a rotation of the member 16 relative to the mounting member 12, this passage 68 also of course allowing for the introduction of the punch rod 20.

The use of the center locator 10 in conjunction with the outside periphery of a cylindrical member will be readily apparent from FIGURE 5 wherein it is noted that the circular upper edge 70 of the cylindrical object 72 is received at the juncture between the inner edge portions 54 and 56 with the portions 54 acting in the manner of support shoulders. Once the legs have been properly positioned in this manner, through a movement of the adjusting member 16 downwardly toward the head end of the shank 22, the common center of the legs, and thereby the center of the cylindrical member 72, is in direct alignment with the centrally located punch passage 36 through the mounting member 12, thereby enabling the marking of this center point through the introduction of the punch rod 20 through the passage 36 and into engagement with the upper end of the cylindrical member 72. The punch rod 20 itself projects a sufficient distance above the upper end of the adjusting member 16 as to enable it to be easily manipulated and even struck with a hammer so as to provide a positive mark at true center.

The use of the device in conjunction with an inside circumference will also be readily appreciated from FIGURES 3 and 4 wherein it will be noted that the outer corner of the lower ends 50 of the legs 14 are abutted against the inner periphery of the particular hole or bore 74 involved, these ends 50 preferably resting on the bottom 76 thereof for proper stability and so as to ensure a planar orientation of the legs 14, as well as to provide an area upon which the center can be marked. The particular angular configuration of the outer edges 40 of the legs 14 is so as to ensure a proper and preferable point contact of each leg 14 with the adjoining bore wall. Accordingly, the edge portion 48, paralleling the major portion of the outer edge 40 and being off-set a substantial distance inward thereof, will normally be positioned flat against the bore wall at the innermost extreme position of the legs 14 with contact with the wall of any larger bore being solely at the outer lower end corner defined between the section 48 and the lower end 50. Incidentally, it will also be appreciated that, except within the smallest bores, any projections or overhangs about the mouth thereof can be easily avoided so as to give a true indication of the center.

The foregoing is considered as illustrative only of the principles of the invention. Further, since numerous

modifications and changes will readily occur to those skilled in the art, it is not desired to limit the invention to the exact construction and operation shown and described, and accordingly all suitable modifications and equivalents may be resorted to, falling within the scope of the invention as claimed.

What is claimed as new is as follows:

1. A center locator including a mounting member, at least three legs positioned equidistant about said mounting member, said legs each extending generally longitudinally of said member from an inner end positioned inward of one end of the member to an outer end positioned forward of said one end of the member, means pivotally connecting each leg to said one end of the member, means for equally resiliently biasing the outer ends of said legs toward each other and a common center forward of and in alignment with said member, an adjusting member adjustably mounted on said mounting member, said adjusting member engaging the inner ends of said legs and selectively moving these inner ends toward each other, and consequently the outer ends away from each other, against the biasing means, and means for indicating the common center between the outer ends of the legs, said mounting member comprising an elongated threaded shank having a laterally enlarged head on one end thereof forming the aforementioned one end of the mounted member, said legs being pivotally connected to the enlarged head outward of the shank, said adjusting member including an internally tapered portion surrounding said shank and overlying the inner ends of said legs, said tapered portion converging toward the second end of the shank and terminating in a portion threadedly engaged with the shank for adjustment of the adjusting member therealong, said biasing means resiliently biasing the inner ends of the legs away from each other and into contact with the tapered portion, movement of the adjusting member along the shank varying the points of engagement of the inner ends of the legs with the tapered portion, and thereby varying the distance of the outer ends of the legs from the common center.

2. The device of claim 1 including a vertical passage through the mounting member in alignment with the common center of the legs, said means for indicating the common center constituting an elongated straight punch rod slidably received through said passage.

3. The device of claim 2 wherein each leg consists of a generally flat bar orientated radially and having an inner edge and an outer edge, said inner edge having a shoulder-forming offset therein, said outer edge, adjacent the outer end thereof, being inwardly offset forward of the shoulder and defining a flat abutment face generally parallel to the major portion of the inner edge.

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