

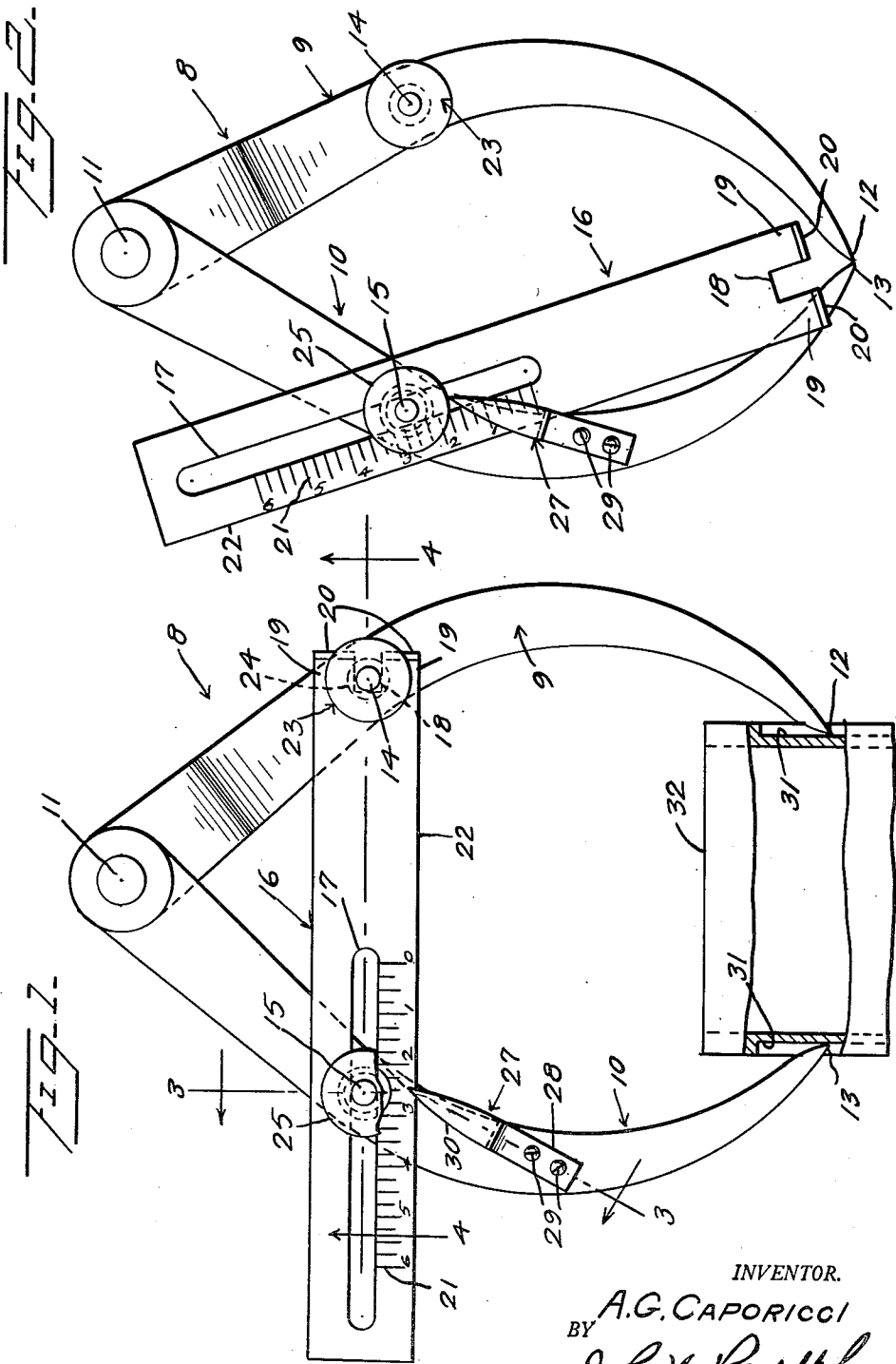
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TRANSFER SCALED CALIPERS

3,014,281

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2 Sheets-Sheet 1



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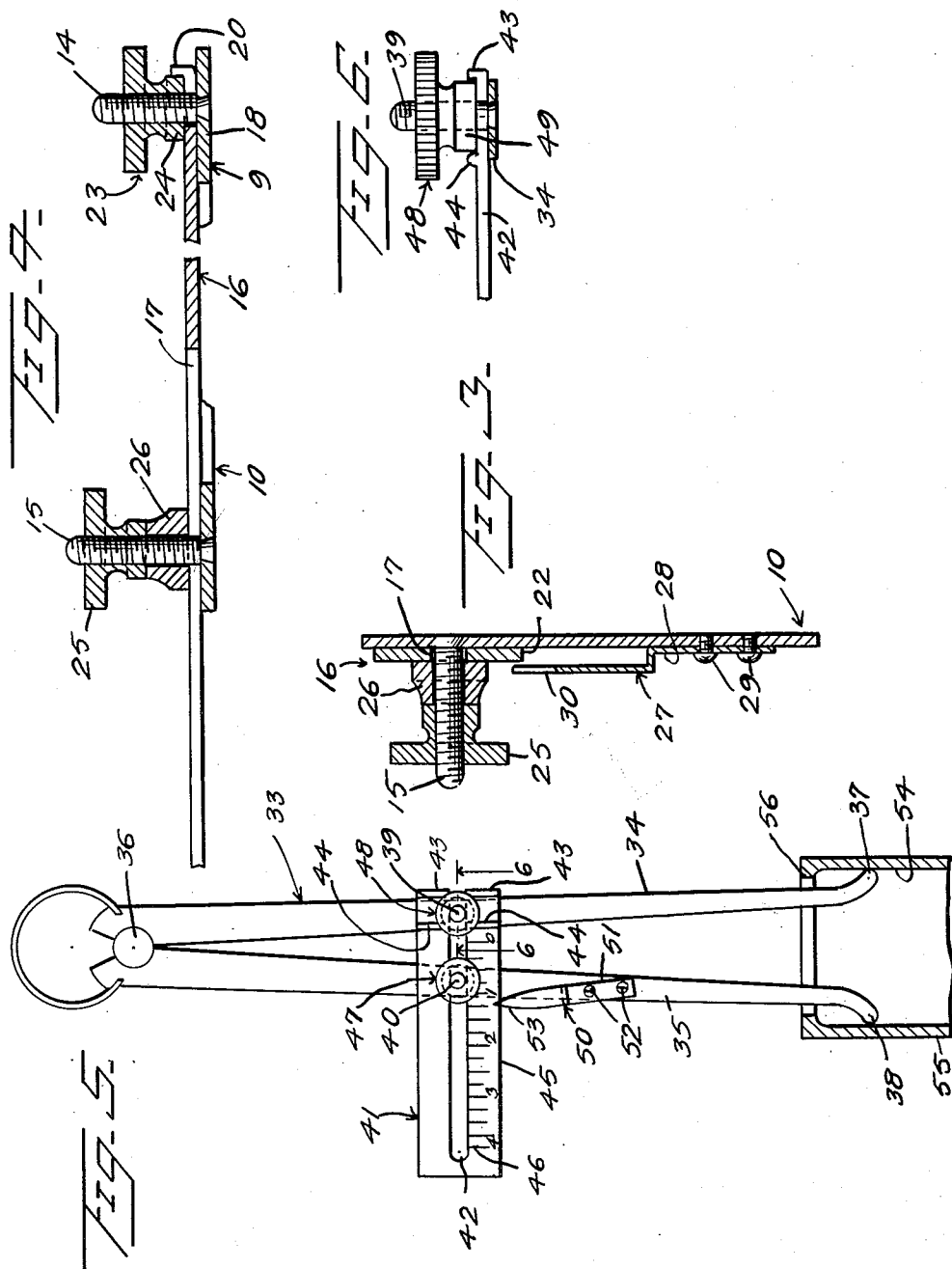
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TRANSFER SCALED CALIPERS

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This invention relates to an improved construction of calipers which may be efficiently employed in inaccessible locations for obtaining measurements and the caliper legs thereafter move relative to one another for removing the calipers from the part measured, without disturbing the reading of the measurement obtained.

A further object of the invention is to provide calipers including a crossbar spanning the caliper legs and having a linear scale thereon calibrated to distances as measured by the tips of the legs.

Various other objects and advantages of the invention will hereinafter become more fully apparent from the following description of the drawings, illustrating presently preferred embodiments thereof, and wherein:

FIGURE 1 is a side elevational view, partly broken away, showing outside calipers constructed in accordance with the invention and applied to a part to be measured;

FIGURE 2 is a side elevational view of the calipers of FIGURE 1 but showing the calipers closed and folded;

FIGURE 3 is an enlarged fragmentary sectional view, taken substantially along a plane as indicated by the line 3-3 of FIGURE 1;

FIGURE 4 is an enlarged fragmentary sectional view, taken substantially along a plane as indicated by the line 4-4 of FIGURE 1;

FIGURE 5 is a side elevational view of an inside calipers, constructed in accordance with the invention, and

FIGURE 6 is an enlarged fragmentary sectional view thereof, taken substantially along a plane as indicated by the line 6-6 of FIGURE 5.

Referring more specifically to the drawings, and first with reference to FIGURES 1 to 4, the outside calipers as illustrated in these views and designated generally 8 includes a pair of caliper legs 9 and 10 which are pivotally connected to one another by a rivet or other pivot fastening 11 at complementary ends of said legs. The legs 9 and 10 are preferably bowed outwardly with respect to one another and preferably taper in width toward their opposite ends which are pointed and constitute the free ends 12 and 13 of the legs 9 and 10, respectively. Threaded studs 14 and 15 are anchored in and project perpendicularly from corresponding sides of the legs 9 and 10, as best seen in FIGURE 4. The studs 14 and 15 are spaced equal distances from the pivot 11.

The calipers 8 also include a bar 16 having an elongated slot 17 which extends from adjacent one end thereof to a point approximately midway of the ends of said bar. The other end of the bar 16 has an outwardly opening notch 18, which aligns with the slot 17, and which forms furcations 19 at said last mentioned bar end each of which has an upturned terminal portion 20. The upturned terminal portions 20 form a transversely extending abutment rib at said notched end of the bar 16. The upturned terminal portions 20 project from the front side of the bar 16 and said front side is provided with graduations, certain of which are numbered, to provide a linear scale 21 between the slot 17 and the longitudinal edge 22 of the bar 16.

The bar 16 spans the legs 9 and 10 and is disposed against the sides thereof from which the studs 14 and 15 project. The stud 15 projects loosely through the slot 17 and the stud 14 has a loose fitting engagement in the notch 18. A knurled thumbnut 23 threadedly engages the stud 14 and has a base portion 24 which bears upon the bar 16 over the notch 18 and which is of a diameter

2

such that when the inner end of the notch 18 is abutting the stud 14 a peripheral part of the base portion 24 will abut against the stop elements 20 to prevent any sliding movement of the bar 16 relative to said stud 14 or nut 23 and thus relative to the calipers leg 9. Another knurled thumbnut 25 threadedly engages the stud 15 and a washer 26 is preferably mounted on the stud 15, between the bar 16 and nut 25.

A pointer 27 has an end portion 28 which is secured to the leg 10 between the bar 16 and the tip 12 of said leg by fastenings 29. The other end 30 of the pointer 27 is outwardly offset from the plane of the leg 10 and tapers to a point which overlies the bar edge 22 to align with graduations of the scale 21, as seen in FIGURE 1.

Assuming that it is desired to measure the distance between the bed portions of two grooves or recesses 31 in a member 32, the nut 25 is loosened to enable the slotted portion of the bar 16 to slide relative to the stud 15 for opening and closing the caliper legs 9 and 10. In this manner the calipers 8 can be opened and the tips 12 and 13 of the legs applied to the grooves or recesses 31 and so as to contact the beds thereof. The spacing between the leg tips 12 and 13 will then correspond to the spacing between the beds of the recesses 31. This spacing will be indicated on the scale 21 and is shown as two and one-half inches. However, the part 32 may be disposed in an inaccessible location where the scale 21 cannot be read while the calipers are applied to the member 32. However, with the calipers 8, this presents no problem as the nut 25 can be tightened to retain the pointer 27 in its correct position with respect to the scale 21 so that there can be no movement of the bar 16 relative to the leg 10, carrying said pointer. The nut 23 is then loosened sufficiently so that the abutment portions 20 can slip under the base 24 to allow the leg 9 to swing relative to the bar 16 and away from the leg 10 to spread the leg tips 12 and 13 so that the calipers can be disengaged from the recesses 31 and moved to a position where the measurement on the scale 21 can be read. Since there is no movement of the bar 16 relative to the leg 10 or pointer 27 in thus effecting detachment of the calipers 8 from the recesses 31, the reading on the calipers will be maintained in spite of the fact that the spacing between the legs has been changed.

FIGURE 2 shows the calipers 8 as they will appear when folded and not in use. This folding of the calipers is accomplished by loosening the nut 25, after the notched end 18 of the bar 16 has been disengaged from the stud 14 and nut 23. The bar 16 can then be turned to a position more nearly lengthwise of the legs 9 and 10 and clamped in this position, as seen in FIGURE 2, by retightening the nut 25.

FIGURES 5 and 6 illustrate the invention embodied in inside calipers, designated generally 33, including legs 34 and 35 which are pivotally connected to one another at complementary ends thereof by a pivot element 36. The legs 34 and 35 are substantially straight and have out-turned terminals 37 and 38, respectively, constituting the free ends thereof.

Threaded studs 39 and 40 are fixed to and project perpendicularly from corresponding sides of the legs 34 and 35, respectively, in the same manner as the studs 14 and 15. A bar 41 is provided with a slot 42 which extends longitudinally thereof from adjacent one end of the bar and which opens through the other end thereof. The bar portions, at the end of the bar through which the slot 42 opens, are turned upwardly to provide abutments 43, corresponding to the abutments 20, and the bar 41 is provided with transversely extending aligned ribs 44 which project from the same side thereof as the abutments 43 and which are spaced from and disposed substantially

parallel to said abutments 43. Said aforementioned front side of the bar 41, between the slot 42 and a longitudinal edge 45 thereof, is provided with graduations and numerals forming a linear scale 46.

A nut and washer, designated generally 47, corresponding to the nut 25 and washer 26, engages the stud 40 and a knurled thumbnut 48, corresponding to the nut 23, engages the stud 39. As seen in FIGURE 6, the base 49 of the nut 48 fits snugly between the abutments 43 and 44 when the nut 48 is tightened against the bar 41.

A pointer 50 has an end portion 51 secured by fastenings 52 against the side of the leg 35 which is engaged by the bar 41 and said pointer has an outwardly offset opposite end which tapers to a point and which pointed end 53 overlies the bar edge 45 to align with graduations of the scale 46.

The calipers 33 are illustrated in FIGURE 5 with the ends 37 and 38 thereof engaging the bore 54 of a member 55. The opening 56, in the end of the member 55 through which the leg ends 37 and 38 are inserted, is smaller than the bore 54. Accordingly, after the leg ends 37 and 38 are inserted through the opening 56 the legs 34 and 35 must be spread. This is accomplished while the nut and washer 47 are loosened, after which the fastening 47 is tightened to clamp the bar 41 to the leg 35 so that the pointer 50 will indicate the correct measurement of the bore 54 or the spacing between the outermost portions of the leg ends 37 and 38. If the calipers 33 are in an inaccessible location and the measurement cannot be read on the scale 46, the nut 48 is loosened so that its base 49 will clear the stop 44. The legs 34 and 35 can then be swung toward one another so that the ends 37 and 38 thereof can be withdrawn through the restricted opening 56 without disturbing the measurement shown by the position of the pointer 50 relative to the scale 46. The scale 46, like the scale 21, is calibrated to the spacing between the leg ends 37 and 38.

Various modifications and changes are contemplated and may be resorted to, without departing from the function or scope of the invention as hereinafter defined by the appended claims.

I claim as my invention:

1. An instrument for use in obtaining linear measurements comprising a first leg and a second leg, means pivotally connecting said legs to one another at complementary ends of the legs, said legs having opposite free ends swingably movable toward and away from one another, a bar spanning said legs and spaced from the ends thereof, a first means detachably fastening a part of said bar to said first leg in a single predetermined position of the bar relative to said first leg, a second means adjustably securing another part of the bar to the second leg, said bar having a linear scale calibrated to the spac-

ing between the free ends of the legs, and a pointer carried by said second leg for indicating measurements on said linear scale, said second means being operable for securing the bar immovably to said second leg, while the bar is fastened by said first mentioned means to the first leg, to retain a correct measurement obtained by the instrument and said first means being thereafter operable to release said first leg from the bar for movement relative to the bar and second leg.

2. A measuring instrument as in claim 1, said first means including a threaded stud projecting from the first leg, a nut threadedly engaging said stud, and means on the bar for confining the nut and stud in a predetermined position relative to the bar when the nut is tightened and to permit movement of said first leg and said nut and stud relative to the bar when the nut is loosened.

3. In combination with a pair of calipers, a bar spanning the legs of the calipers, means adjustably clamping a predetermined part of said bar to a first one of said legs, means slidably connecting and adjustably clamping another portion of the bar to the other second leg, and means carried partially by said bar and partially by the second leg and forming a linear scale for indicating measurements of the free ends of the legs when said part of the bar is secured to the first leg by said first mentioned means, and said first mentioned means being operable to release the first leg from said bar part for movement of the first leg relative to the second leg and bar and while the bar is held immovably relative to the second leg by said second mentioned means.

4. In combination with a pair of calipers including a first leg and a second leg, a bar spanning the legs, means detachably fastening a predetermined part of the bar to a predetermined part of the first leg, means slidably connecting the bar to the second leg, means carried partially by the bar and partially by the second leg and forming a linear scale calibrated to correctly measure the spacing between the free ends of the legs when the first leg and bar are fastened together by said first mentioned means, and means detachably clamping the bar to the second leg for retaining a measurement after the first mentioned means is released and the first leg is moved relative to the bar and second leg.

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