Aug. 19, 1958 F. E. BATEMAN 2,847,765

LEVEL PROTRACTOR TOOL

Filed Jan. 25, 1957

Fig. 1

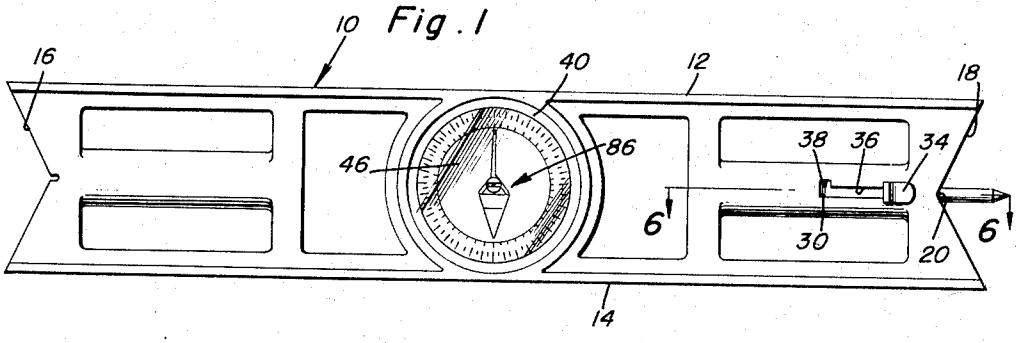


Fig. 2

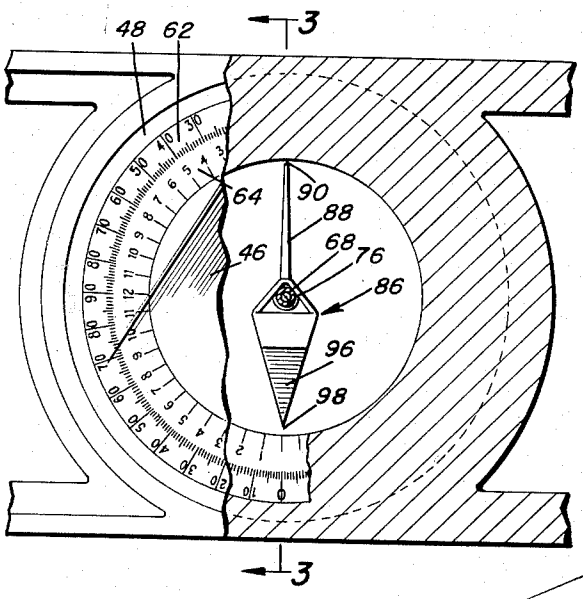


Fig. 3

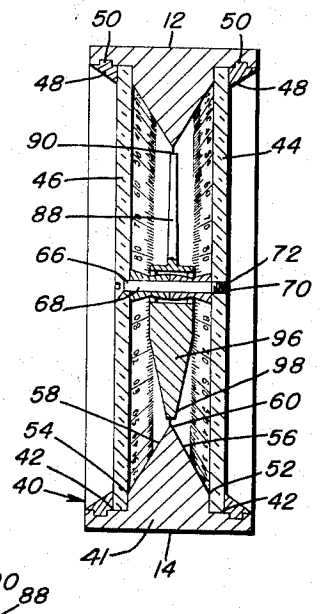
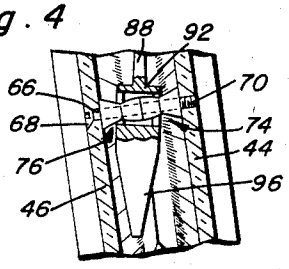


Fig. 4



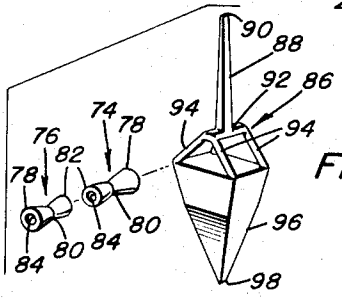


Fig. 5

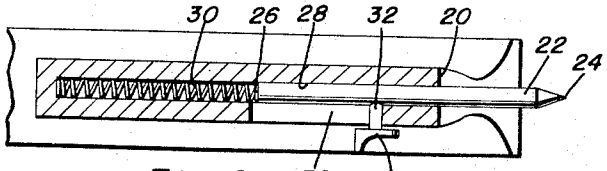


Fig. 6

Floyd E. Bateman

INVENTOR.

BY Clarence A. O'Brien and Harvey B. Jacobson

Attorneys

United States Patent Office 2,847,765 Patented Aug. 19, 1958

2,847,765

LEVEL PROTRACTOR TOOL

Floyd E. Bateman, Tupelo, Okla.

Application January 25, 1957, Serial No. 636,339

1 Claim. (Cl. 33—215)

This invention relates in general to hand tools and more particularly to a tool for horizontal pipe line branch lay-out work.

The primary object of this invention is to provide a hand tool for use by carpenters, brick layers, and plumbers, who ordinarily use a spirit level for levelling structures and pipe lines, the improved tool taking the place of the ordinary spirit level.

A further object of this invention is to provide a tool which may be utilized to indicate the degrees of slope of any part of a structure or of a pipe line, in the case of a plumber.

A further object of this invention is to provide a hand tool which may be utilized by a plumber or steam fitter for laying out centers of branch lines from a horizontal run of pipe, the branch line being laid out at the proper angle by use of the tool.

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 a view in elevation of one side of the level protractor tool;

Figure 2 is a fragmentary enlarged side elevation of the indicating dial of the tool, with portion broken away for clarity;

Figure 3 is a sectional view taken substantially along section line 3—3 of Figure 2;

Figure 4 is a fragmentary sectional view taken substantially along section line 4—4 of Figure 2, with details of a pivot pin and the counterweighted pointer clearly shown;

Figure 5 is a further enlarged exploded perspective view of a pivot spool and the weighted indicator; and

Figure 6 is an enlarged fragmentary, sectional view taken substantially along section line 6—6 of Figure 1 and showing details of the built-in spring actuated center punch.

Referring now to the drawings in detail, it will be seen that the level protractor tool consists of an elongated frame, which is referred to in general by the reference numeral 10. The frame 10 consists of side edges 12 and 14, which are parallel along the longitudinal length thereof, and two ends which are V'd inwardly as at 16 and 18. The edges 12 and 14 are planar and in addition to being parallel longitudinally of the tool they are also transversely parallel. The V'd end 18 has disposed at the apex of the V 20, and along the longitudinal center line of the tool a cylindrical punch 22 which terminates at the outer end thereof in a point 24, and at the inner end thereof in a circular face 26. The punch 22 is free to slide within an aperture 28 and is urged outward by means of a coil spring 30. Intermediate ends 24 and 26 of the punch there is attached thereto an operating handle 32 and an operating button 34. The operating handle 32 extends outward transversely through the

frame 10 through a longitudinally extending elongated slot 36, the slot 36 terminates at the inner end thereof in a keeper notch 38 which engages the operating handle 32 when the punch is withdrawn by means of the operating button 34 and then rotated in the notch 38.

Centrally disposed in the frame 10 there is provided a transverse circular opening which is referred to in general by the reference numeral 40. As is best seen in Figure 3 the opening 40 is provided with a circular recess as at 42 on each side of the tool to receive spaced apart coaxial disks 44 and 46 which are transparent for reading therethrough. The disks 44 and 46 are maintained in the tool by means of plaster of Paris 48, or other similar material used on like instruments. The plaster of Paris is maintained in position by means of a circular keying notch 50, which is also standard construction.

Intermediate the disks 44, 46 an annular flange 41 on the frame 10 is provided in the opening 40 centrally thereof and which is generally V-shaped in cross-section and formed with a pair of base faces 52, 54 at opposite sides thereof radial to the opening 40 and against which the disks 44, 46 bear and are spaced apart thereby, said flange 41 providing thereon oppositely bevelled or inclined side faces 56, 58 extending from the base faces 52, 54 and terminating in an apex 60. The faces 56 and 58 contain duplicate circular scales, a scale 62, graduated in degrees and a scale 64 graduated in inches per foot rise. It should be understood that the apex 60 is equidistant from the disks 44 and 46 and therefore centrally disposed with respect to the transverse dimension of the tool.

There is provided in the disk 46 an aperture 66 which is concentric with the opening 40 and adapted to receive a flat headed pivot pin 68, the pivot pin 68 extends through the disk 46 and has at the opposite end thereof a threaded portion 70 which is received in a threaded aperture 72 in the disk 44. The pivot pin 68 carries a pair of spool-like pivot bearings, which are referred to in general by reference numerals 74 and 76. Inasmuch as the spools 74 and 76 are identical, one spool only will be described and like reference numerals used on both. The spool 74 consists of a somewhat hyperboloid shaped member having an outer circular face 78, and an inner circular face 82. An axially extending bore 84 is provided therein. When assembled, the faces 78 are in close face-to-face relationship with the disk, with the pin 68 through the bores 84 and the faces 82 in face-to-face engaging relation with each other. As will be seen, the spools 74, 76 are V-shaped circumferentially to provide a pair of V-shaped grooves 80 spaced longitudinally of the pivot pin 68 and at opposite sides of the engaging faces 82 of said spools.

The pivot bearings 74 and 76 receive thereon a counterweighted indicator which is referred to in general by the reference numeral 86 and has an elongated pointer 88 with a knife-edge tip 90 thereon. The pointer 88 terminates at the opposite end thereof in a transversely extending arm 92, which in turn terminates at the ends thereof in laterally spaced pairs of downwardly extending diverging legs 94. The legs 94 have attached thereto an inverted pyramid-shaped counterweight 96. It should be noted that when the indicator 86 is assembled on the spools 74, 76, the pairs of legs 94 straddle and ride in the grooves 80 of the spools 74, 76 with the crossbar 92 spaced above the engaging faces 82 of said spools, thereby providing a relatively friction proof and freely rotatable indicator which is pivotal laterally in either groove 80. It should be further noted that the counterweight 96 terminates at the apex thereof in a knife edge 98, the purpose of which will be described hereinafter. The V-shaped grooves 80 and legs 94 prevent lateral shifting bodily of the indicator on its pivot.

In operation the level protractor tool, when used as an ordinary spirit level, may be used on roof rafters to indicate by direct reading the degrees of slope or the slope in inches per feet, it should be here noted that either the knife edge **90** or the knife edge **98**, which are in close proximity to the apex **60** may be utilized in reading the scale provided. When utilized for pipe lay-out work, assuming that branch lines at various angles are to be laid out on a horizontal run of pipe, the center punch **22** is retracted into the aperture **28**, thus compressing the spring **30** and the operating handle **32** is engaged in the notch **38**. The V **18** is then placed on the horizontal run of pipe and the tool rotated about the pipe until the desired reading is obtained on the scale. The operating handle is then released from the notch **38** and the center punch, actuated by the spring **30** strikes the pipe line, thus indicating the center of the required branch line.

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:

A level protractor tool comprising an elongated frame having a central circular opening and provided with an annular central flange in said opening substantially V-shaped in cross-section and providing oppositely inclined graduated faces thereon, a pair of transparent coaxial disks fixed in said opening at opposite sides of said flange for viewing the graduations therethrough and closing said opening, a pivot pin extending transversely through said disks in the axis thereof and fixed to said disks, a pair of end-to-end spools on said pivot pin having circumferential V-shaped grooves therein and engaging ends and forming a bearing, and a counterweighted indicator between said disks including a bar extending across and spaced above said engaging ends of said spools and having terminal pairs of end legs straddling and riding in said grooves and whereby said indicator is pivotal laterally on said bearing and rotatable thereon and held against bodily shifting longitudinally of said pin, said graduated faces providing for reading of said indicator against the graduations from either side of the frame.

References Cited in the file of this patent

UNITED STATES PATENTS

736,073	Collicutt	Aug. 11, 1903
751,763	Wagor	Feb. 9, 1904
909,046	Woolson	Jan. 5, 1909
948,523	Perkins	Feb. 8, 1910
1,541,455	White	June 9, 1925
2,220,029	Stephan	Oct. 29, 1940
2,569,349	Smith	Sept. 25, 1951