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COMBINATION MAGNETIC LEVEL AND CENTER FINDER DEVICE

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FIG. 1.

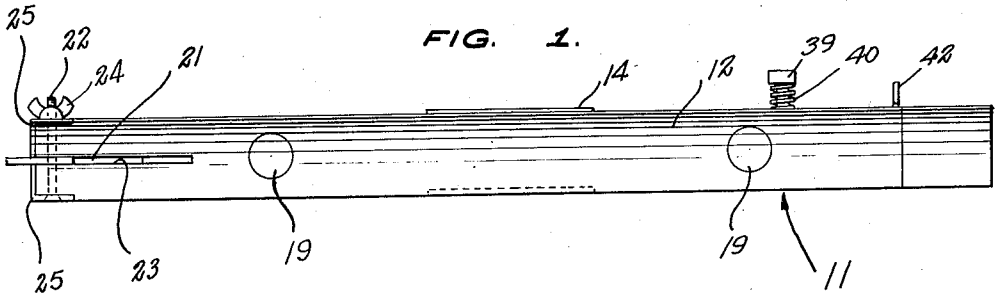


FIG. 2.

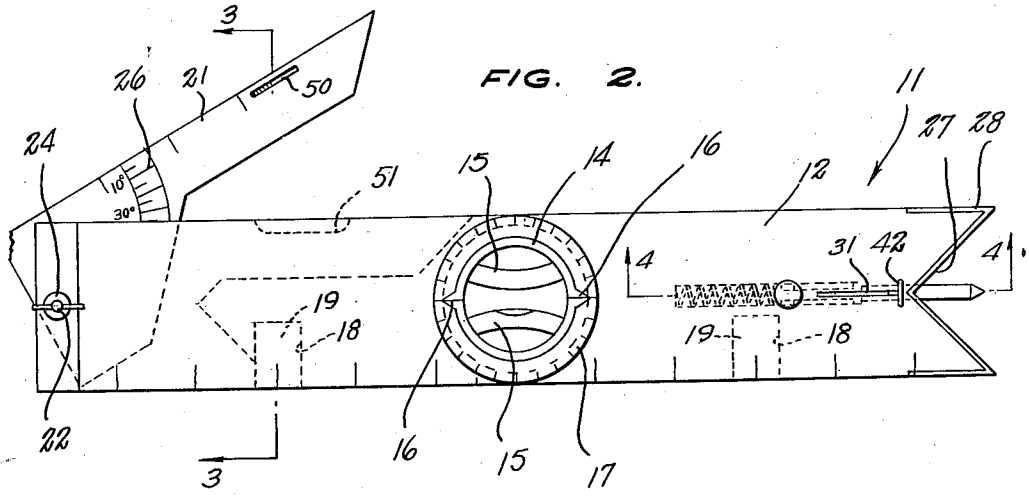


FIG. 3.

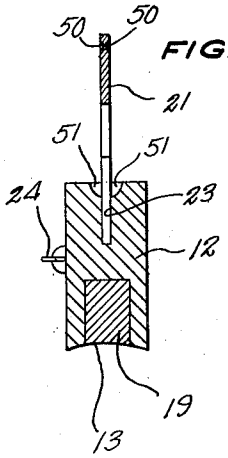
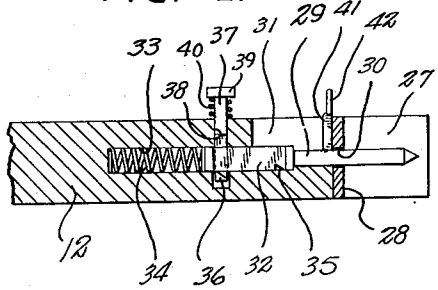


FIG. 4.



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COMBINATION MAGNETIC LEVEL AND CENTER FINDER DEVICE

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2 Claims. (Cl. 33—88)

This invention relates to level devices, and more particularly to an improved combination magnetic level and center finder device especially suitable for use in working with metal objects such as pipe, sheet metal, and the like.

A main object of the invention is to provide a novel and improved combination level and center finder device which is simple in construction, which is easy to use, and which involves only a few components.

A further object of the invention is to provide an improvide combination magnetic level and center finder device which is inexpensive to manufacture, which is rugged in construction, which may be employed as a protractor, and which is especially useful in working with objects such as pipe, sheet metal, steel structural members, and the like.

Further objects and advantages of the invention will become apparent from the following description and claims, and from the accompanying drawings, wherein:

Figure 1 is a top view of an improved combination magnetic level and center finder device constructed in accordance with the present invention.

Figure 2 is a side elevational view of the device shown in Figure 1.

Figure 3 is a transverse vertical cross sectional view taken on the line 3—3 of Figure 2.

Figure 4 is a cross sectional detail view taken on the line 4—4 of Figure 2.

Referring to the drawings, the improved combination magnetic level and center finder device is designated generally at 11 and comprises an elongated level bar 12 which is substantially rectangular in cross sectional shape, and which is preferably provided with the transversely arcuate bottom edge 13, as shown in Figure 3. Rotatably mounted in the intermediate portion of the bar 12 is a bubble level assembly 14 containing bubble levels 15, 15 in a conventional arrangement, the assembly 14 being rotatable in the plane of the bar 12 and being provided with pointer elements 16, 16 which are movable along a circular angle scale 17, whereby the level device may be employed as a protractor.

The body 12 is of a non-magnetic material and is formed with a plurality of spaced recesses 18 extending transverse to and from the bottom edge 13 of the bar, as shown in Figure 2, said recesses being, for example, spaced symmetrically on opposite sides of the intermediate portion of the bar member. Thus, as shown in the typical embodiment of the invention illustrated in the drawings, two recesses 18, 18 are provided, said recesses being spaced equal distances on opposite sides of the centrally located level tube assembly 14, the recesses 18 extending vertically from the horizontal bottom edge of the bar 12.

Secured in the respective recesses 18, 18 are respective permanent magnets 19, 19, the bottom ends of the magnets being arcuately curved so that said bottom ends are flush with the arcuately curved bottom edge of the bar 12.

The arcuate curvature of the bottom edge 13 of the bar 12 allows said bar to be readily mounted on a pipe or other round object, in a position extending longitudinally of the pipe or similar round object, the bar being held in place on the pipe or other round object by the magnetic action of the permanent magnets 19, 19 on the pipe, assuming the pipe, or other object above mentioned to be of magnetic material, such as steel, iron, or the like.

Designated at 21 is a protractor blade which is pivotally connected at 22 to one end of the bar 12, said blade 21 being received in a suitable slot 23 provided in the bar, whereby the blade 21 may be housed in said slot at times in a flush position. The blade 21 may be elevated with respect to the top edge of the bar 12 and may be clamped in an angularly adjusted position by means of a wing nut 24 threadedly engaged on the pivot bolt 22, as is clearly shown in Figure 1.

The end of the bar adjacent the blade 21 may be provided with suitable abrasion-resistant angular wear plates 25, 25, said wear plates protecting the corners of the bar against abrasion.

As shown in Figure 2, the protractor blade 21 is provided with a suitable angle scale 26, whereby the angular position of the protractor blade 21 with respect to the level bar 12 may be readily ascertained.

Thumb nail-engaging grooves 50 are provided in the top marginal portion of the protractor blade 21, and the inside walls of the slot 23 are notched or recessed at their top portions, as shown at 51, adjacent said grooves 50 when the blade 21 is received fully in slot 23, to provide a means for elevating the blade 21 from the slot 23.

The end of the level bar 12 opposite the protractor blade 21 is formed with a V-notch 27 which is suitably protected by an abrasion-resistant wear plate 28, as shown in Figure 2. Designated by 29 is a punch rod which is slidably mounted longitudinally in the end portion of bar 12 adjacent the V-notch 27, said punch extending slidably through an aperture 30 provided centrally in the wear plate 28, as shown in Figure 4.

The bar 12 is slotted, as shown at 31, above the rear portion of the punch rod 29, said punch rod being provided with a rear head portion 32 of rectangular cross section which is slidably received in a rectangular bore 33 formed in the bar 12 rearwardly adjacent the slot 31 containing a coiled spring 34 which biases the punch rod outwardly.

The rectangular head portion 32 is formed on its bottom surface, as viewed in Figure 4, with a transverse locking notch 35 which is lockingly engageable by the transversely extending detent portion 36 of a catch member 37 slidably mounted in a transverse recess 38 formed in bar 12 adjacent the slot 31. The catch member 37 is provided with a head 39, and surrounding the shank portion of the catch member is a coiled spring 40 which bears between head 39 and the subjacent surface of the bar 12, biasing the catch member 37 upwardly, as viewed in Figure 4, and biasing the detent element 36 against the bottom surface of the enlarged rectangular portion 32 of the center finder punch rod 29.

Rigidly secured to the forward portion of the marker punch rod 29 is a vertically extending arm 41 having an external finger tab element 42, the spring 34 biasing the center finder rod 29 forwardly to a position wherein the arm 41 engages the wear plate 27, as shown in Figure 4. However, the punch rod 29 may be retracted by means of the finger tab 42 to allow the detent element 36 to lockingly engage in notch 35, whereby the punch rod 29 will be releasably retained in its retracted position. To release the center finder rod 29, it is merely necessary to exert pressure on the head 39, causing the catch member 37 to be depressed sufficiently to allow detent element 36 to disengage from the notch 35, whereupon the spring 34 will project the center finder rod 29 outwardly.

Thus, in using the center finder element of the device, the pipe or other round object to be inscribed with a punch mark is engaged in the notch **27** with the level bar **12** held perpendicular to the pipe or similar object to be marked, the center finder **29** is retracted to its held position wherein detent element **36** engages in the notch **35**, and the head **39** is then pushed inwardly to release the center finder rod, whereby the punch rod is projected outwardly with substantial force, causing the tip of the punch rod to indent the object.

While a specific embodiment of an improved combination magnetic level device and center finder has been disclosed in the foregoing description, it will be understood that various modifications within the spirit of the invention may occur to those skilled in the art. Therefore, it is intended that no limitations be placed on the invention except as defined by the scope of the appended claims.

What is claimed is:

1. In a combination level bar and center finder of the type comprising an elongated level bar provided with a bubble level tube therein, one end of said bar being formed with a V-notch, a horizontal punch rod slidably mounted longitudinally in said end and projecting axially into said V-notch, spring means biasing said punch rod outwardly of said notch, a vertical catch member slidably mounted in said bar perpendicular to and adjacent to said punch rod, a transversely extending horizontal detent element on said catch member lockingly engageable with the bottom surface of said punch rod, and spring means urging said detent element upwardly into latching engagement with said punch rod and being arranged to releasably hold said punch rod in a retracted position relative to said notch.

2. In a combination level bar and center finder of the type comprising an elongated level bar provided with a bubble level tube therein, a protractor blade pivotally secured in one end of the level bar for rotation in the longitudinal plane of the bar, and means therein to clampingly secure said blade in an angularly adjusted position relatively to a longitudinal edge of the level bar, the other end of said bar being formed with a V-notch, a horizontal punch rod slidably mounted longitudinally in said other end and projecting axially into said V-notch, said rod being formed with a transversely extending detent notch in its bottom surface, spring means biasing said punch rod outwardly of said V-notch, a vertical catch member slidably mounted in said bar perpendicular to said punch rod and adjacent thereto, a transversely extending horizontal detent element on said catch member lockingly engageable in said detent notch, and spring means acting between said level bar and said catch member and urging said detent element upwardly into latching engagement with said detent notch.

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