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GRADE MEASURING ATTACHMENT FOR CARPENTERS' OR BUILDERS' LEVELS

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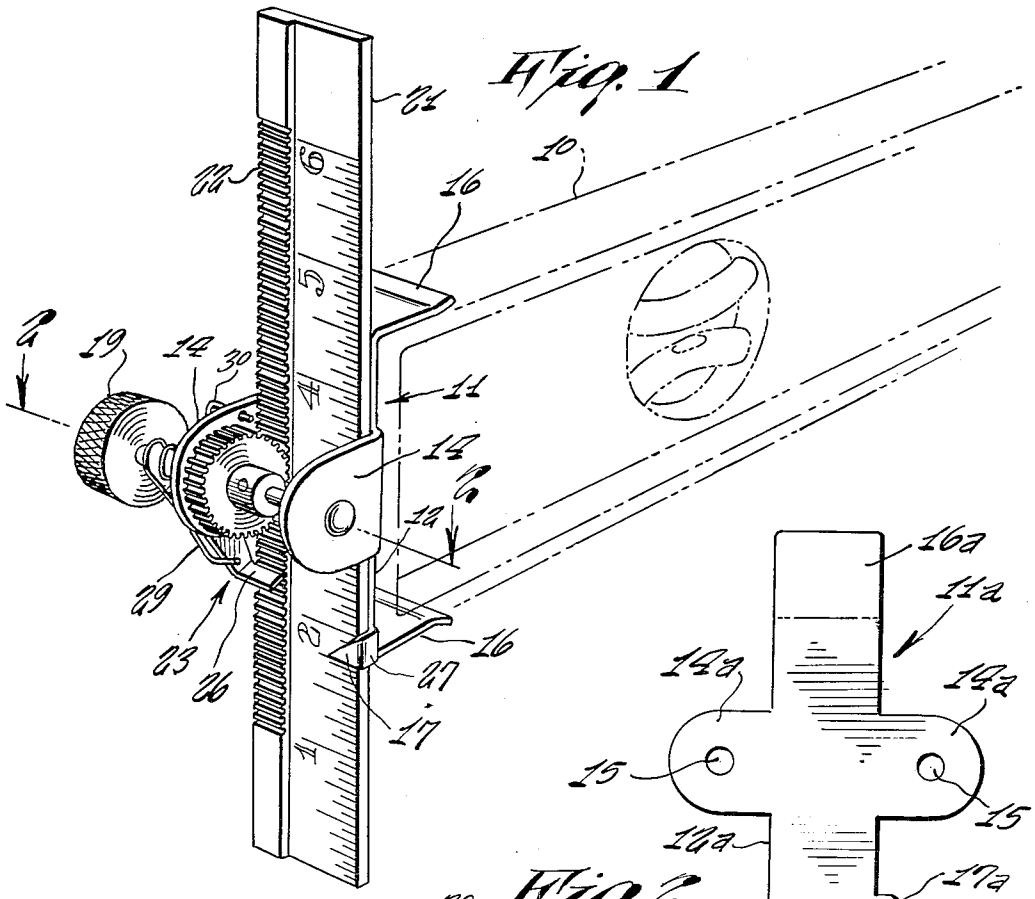


Fig. 1

Fig. 3

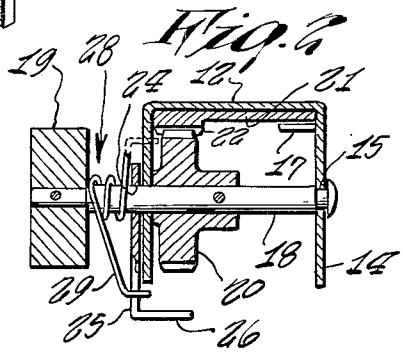


Fig. 2

Fig. 4

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GRADE MEASURING ATTACHMENT FOR CARPENTERS' OR BUILDERS' LEVELS

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1 Claim. (Cl. 33—214)

This invention relates to carpenters' or builders' levels, and the main object is the provision of a readily attachable or removable grade or slope measuring attachment on one end of the level, so that the grade may be immediately read in inches per foot or in any other desired linear units. The invention is applicable in many jobs, obviously too numerous to be mentioned, but as a single example the laying of concrete or masonry in the construction of walls, sidewalks, floors, or the like may be cited.

Another object of the invention is the provision of an attachment for levels for the purpose mentioned, which is simple in construction and operation and inexpensive in cost of manufacture.

The above broad as well as additional and more specific objects will be clarified in the following description wherein characters of reference refer to like-numbered parts in the accompanying drawing. It is to be noted that the drawing is intended solely for the purpose of illustration and that it is therefore neither desired nor intended to limit the invention necessarily to any or all of the exact details of construction shown except insofar as they may be deemed essential to the invention.

Referring briefly to the drawing, Fig. 1 is a perspective view of the attachment embodying the present invention, shown attached to a level, the latter being drawn in phantom.

Fig. 2 is a sectional view taken on the line **2**—**2** of Fig. 1.

Fig. 3 is a laid out pattern of the material, preferably sheet metal possessing a degree of resiliency, out of which the supporting frame of the device is shaped.

Fig. 4 is a side elevational view of a level equipped with the present attachment, illustrating how the combination may be used to measure a grade.

Referring in detail to the drawing, the numeral **10** indicates or represents any conventional level, to either end of which the present attachment may be applied.

The attachment comprises a frame **11** which may be formed out of the pattern **11***a* shown in Fig. 3. The frame comprises a back **12** adapted to engage the end wall **13** of the level, the horizontally spaced pair of identical ears **14** having aligned holes **15** therethrough, the rearwardly extending vertically spaced horizontal yieldable clamp jaws **16**, and the index finger or indicator **17** spaced forward from and parallel with the back **12**. The parts of the pattern **11***a* from which the parts of the frame, just indicated, are formed by obvious suitable bending, are indicated by the same reference numerals followed by the suffix "*a*."

A shaft **18** is rotatably supported in the holes **15** of the ears **14**, having a turn knob **19** on one end and having keyed thereto between the ears a pinion **20**. A rigid strip, having its face graduated in a linear scale, shown at **21**, and provided with rack teeth **22** over the greater portion of its length, is slidably mounted against the back **12** with the rack **22** engaged by the pinion **20**. The indicator **17** is spaced forward from the back **12** a sufficient distance, through the medium of the support or base **27** between the back **12** and the indicator, to enable the strip or rule **21** to slide between the indicator and the back, whence the indicator, which is flat as shown, provides also a guide to confine the rule to sliding movement within its own plane.

It is apparent from the disclosure thus far, that by rotating the knob **19** the rule may readily be raised or lowered to accommodate the level to a true horizontal position on a slope, as illustrated in Fig. 4.

In order to automatically but releasably lock the rule **21** in the downwardly extended position to which it has been moved by the pinion **19** to meet the slope, as shown in Fig. 4, the following additional means is provided. An L-shaped pawl **23** has a hole **24** in its arm **25**, through which the shaft **18** passes and thus rotatably supports the pawl, which is positioned between the knob **19** and the adjacent ear **14**, with the pawl tooth **26** extending inward over the rack **22**. A coiled spring **28** has its intermediate portion coiled about the shaft **18** between the knob **19** and the pawl arm **25**. The ends of the spring **28** constitute legs **29** and **30**; the leg **29** has a deformed extremity resting and pressing against the pawl arm **25** near the lower end of the arm, and the leg **30** has a similar deformed extremity anchored in an opening through the adjacent frame ear **14**. Thus, the pawl arm **29** is normally urged down against the base of the ear **14** to normally urge the pawl tooth **26** into engagement with the rack **22**. Upon rotation of the knob **19** clockwise, Fig. 1, the pinion moves the rule downward and in so moving the rack teeth successively push the tooth **26** outward and the spring returns it successively to the notches between the rack teeth. The tooth, however, resists outward movement from the rack when upward movement of the rule is attempted, or, in other words, it will support the end of the level, as shown in Fig. 4, in its extended position. Thus, knowing the length of the level, the grade of the slope can be read right off the rule, by noting the linear distance shown at the indicator **17**, in inches per foot.

Obviously, modifications in form or structure may be made without departing from the spirit or scope of the invention.

I claim:

A grade measuring attachment for an elongated member having horizontal top and bottom walls and a vertical end wall, comprising a frame, said frame including a back adapted to set against said end wall, said back having vertically spaced resilient horizontal jaws extending rearward from said back adapted to frictionally engage said top and bottom walls and thus clamp the frame to the end of the member, said back having horizontally spaced ears extending forward therefrom substantially at right angles thereto, said ears having aligned openings therethrough, a shaft rotatably mounted in said openings and having one end thereof extending a distance beyond the adjacent ear, said end of said shaft having a turn knob thereon, said shaft having a pinion thereon between said ears, a graduated rigid strip slidably mounted against said back and having a rack thereon engaging said pinion whereby rotation of said knob moves said strip vertically, a pawl rotatably mounted on said shaft between said adjacent ear and said knob, and an elongated spring having the intermediate portion thereof coiled about said shaft, one end of said spring being anchored in said adjacent ear, the other end of said spring engaging said pawl and urging the same into engagement with said rack thereby releasably locking said strip against retraction in the downwardly extended position of the strip.

References Cited in the file of this patent

UNITED STATES PATENTS

143,942	Thornley	Oct. 21, 1873
310,048	Grams	Dec. 30, 1884
986,924	L'Heureux	Mar. 14, 1911
1,305,636	Weilep	June 3, 1919
1,346,619	Weathersby	July 13, 1920
2,520,700	Thorndyke	Aug. 29, 1950