Nov. 3, 1936. R. J. HINSON 2,059,580

TREE CALIPER

Filed Aug. 23, 1935

Fig. 1.

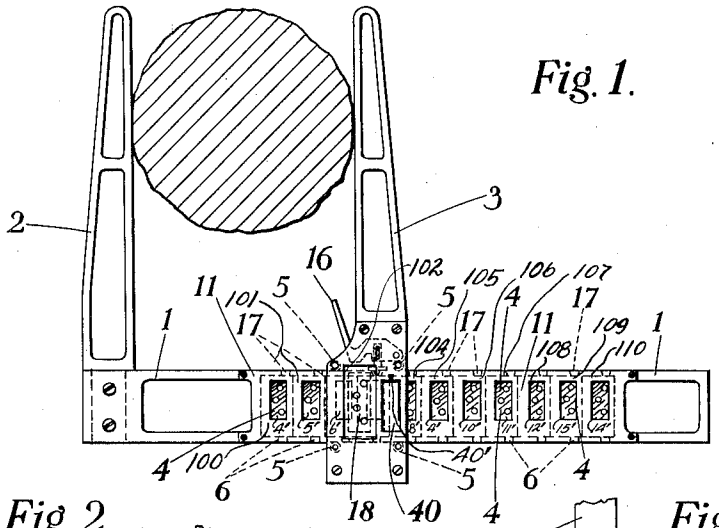


Fig. 2.

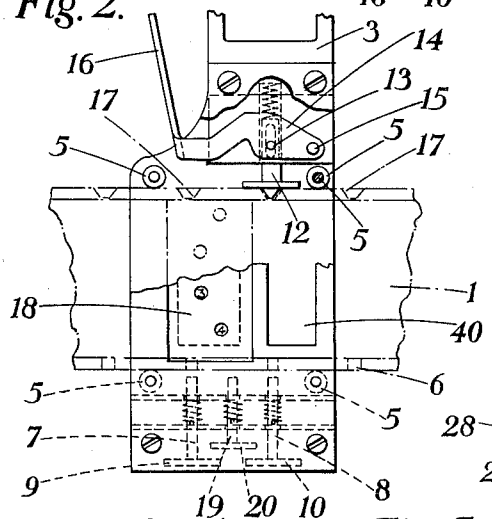


Fig. 3.

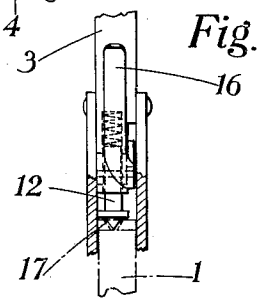


Fig. 7.

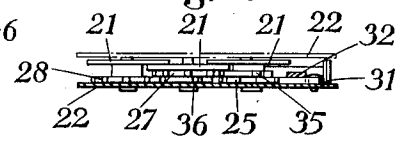


Fig. 4.

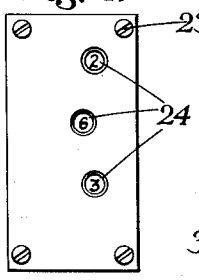


Fig. 5.

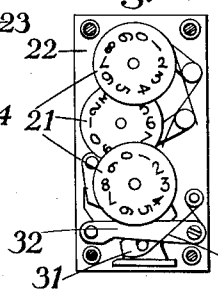
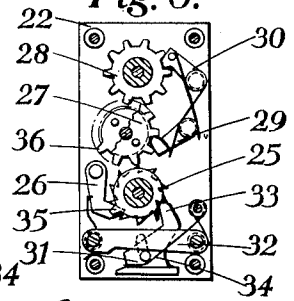


Fig. 6.



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TREE CALIPER

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4 Claims. (Cl. 235—1)

The present invention relates to tree calipers, which, as their name implies, are calipers of large size for measuring the diameters of trees. Usually such calipers comprise an arm fixed at right angles to a slide rod graduated in inches, and a co-operating arm extending parallel to the fixed arm and slidable along the rod. The instrument is applied to a tree with the arms on opposite sides thereof and the sliding arm is moved towards the fixed arm until both arms touch diametrically opposite points of the tree trunk. The diameter is then read off on the graduated rod.

Hitherto, in taking stock of timber in a forest, it is usual for the person operating the calipers to be accompanied by another person who makes a written record of the number of trees measured of each different diameter. The object of this invention is to eliminate the need for such an additional person and this is accomplished by providing the calipers with means for registering the individual number of trees measured of various sizes. The instrument may also include means for registering the total number of trees measured of all sizes.

The combined tree calipers and registering device comprises the usual fixed arm, slide rod, and sliding arm, but in accordance with this invention it may also comprise a series of counting devices allocated respectively to a number of different diameters, and means operable when the movable arm of the calipers is set to a particular diameter, to operate the counting device allocated to said diameter. Thus, instead of the slide rod being graduated in inches or other units it may have embodied therein at inch, or other unit distances, a series of mechanical counting devices, and the movable arm may have associated therewith an operating member which is adapted, when operated by the person using the calipers, selectively to operate the mechanical counting devices in accordance with the distance between the fixed and movable arms of the calipers.

As will be readily appreciated, with the above device a single person can continue applying the calipers to trees, and after every setting he merely actuates the operating member of the sliding arm so as to advance by one unit the corresponding counting device. Consequently at any time it is only necessary to inspect the counting devices in order to ascertain the numbers of trees of various diameters which have been measured, without the aid of any written record.

Preferably also the device comprises an additional counter for totalling the aggregate number of trees measured. This counter is automatically operated every time the operating member of the individual counters is actuated and its reading serves as a check on the individual size counters.

The invention is illustrated by way of example only, in the accompanying drawing, in which:—

Figure 1 is a general view of one construction of calipers according to the invention.

Figure 2 is an enlarged detail view showing the mechanism of the sliding arm.

Figure 3 is a side view corresponding to part of Figure 2.

Figure 4 shows one of the counters externally to an enlarged scale.

Figure 5 is a plan view of the counter with the upper cover plate removed.

Figure 6 is a plan view corresponding to Figure 5, but with the numeral discs and other parts removed for the sake of clearness, and

Figure 7 is a side elevation corresponding to Figure 5.

Referring to the drawing, the calipers comprise a slide rod 1 carrying a fixed arm 2 at right angles and a sliding arm 3 also at right angles. The slide rod 1 is of rectangular cross section and of skeleton construction, and contains a series of mechanical counting devices 4 side by side at the required distance of one inch or other unit distance apart. The arms 2 and 3 are also of skeleton construction, the sliding arm 3 being provided with rollers 5 to engage the upper and lower edges of the slide rod 1 to facilitate its movements along rod 1.

Along its lower edge the rod 1 has a series of holes 6 corresponding to the various counting devices 4, through which may enter a rod or plunger 7 or 8 carried by the sliding arm 3 and adapted to be projected into one or other of the holes 6 when pressure is applied to its operating head 9 or 10.

The counters 4 are covered over with celluloid or like transparent material and held in position by an apertured cover plate 11, having apertures 100, 101, 102, 103, 104, 105, 106, 107, 108, 109, and 110, while the plungers 7 and 8 are normally held clear of the lower edge of the slide rod, by suitable springs surrounding their stems.

In addition to the operating mechanism for the counters 4 the slide arm 3 also carries mechanism for clamping it to the rod 1 in positions in which the rods or plungers 7 and 8 register with a pair of adjacent openings 6, so that the corresponding counter 4 is actuated when the member

9 or 10 is operated, since it will be obvious that the counters 4 can only be operated when the sliding arm 3 is at a distance from the arm 2 which is an exact multiple of the unit distance. This mechanism comprises a spring pressed plunger 12 movable in a bore of the arm 3, said plunger 12 having a pin 13 projecting laterally through a slot in the arm 3 and engaging with an operating lever 14 pivoted to the arm 3 at 15. The said lever 14 has a handle portion 16 located against the inner side of arm 3, which when drawn by the finger towards the arm 3 draws the plunger 12 in the upward direction.

The lower end of the plunger 12 is conical and adapted to engage with one or other of a number of conical recesses 17 along the upper edge of the slide rod 1, which are so located that when the plunger 12 is engaged with a recess 17, the plungers 7 and 8 register with a pair of adjacent holes 6.

Further, as a check on the registration effected by the individual counters 4 the calipers include an aggregate counter 18 carried by the head of the sliding arm 3, which is automatically operated each time one or other of the plungers 7 or 8 is operated. If the counters 4 are three figure counters the counter 18 may, for example, be a four figure counter, and its indicated number should at all times equal the totals of the indications of the counters 4, thus indicating the total number of trees measured independent of their individual sizes. This counter 18 is operated by a plunger or rod 19 having an operating head 20 which is located behind and between the two operating heads 9 and 10, so that when either of them is pressed in, it engages with the head 20 and operates the counter 18.

By the side of the counter 18 the upper plate of the head of the arm 3 has a rectangular opening 40 exposing the counters 4, and along the upper edge of the opening is an indicating mark 40′ to show the size of a tree being measured, the counters 4 being for this purpose consecutively numbered from left to right, 4′, 5′, 6′, 7′, 8′, 12′, 13′, and 14′. If however, the tree is not an exact number of units in size the indicating mark will come between a pair of adjacent counters. If it comes less than half way between them the operating member 9 is pressed, or if over half way the operating member 10 is pressed so that the tree is measured under the nearest unit size. The mechanical counting devices 4 and 18 may be of any known construction adapted to register up to any desired maximum number. Thus if equipped with three number discs for "units", "tens", and "hundreds" respectively, each counter 4 will register up to a total of 999, while if the counter 18 has four discs it will register up to a total of 9,999.

In a convenient form of counter 4 according to the invention there may be, as illustrated by Figures 4 to 7, three number discs 21 mounted on axis pins projecting from a rectangular base plate 22, a cover plate 23 having inspection openings 24 being mounted over the several discs 21. Below the "units" number disc 21 and in one therewith is a ten-toothed ratchet wheel 25 with which co-operates a spring pressed pawl 26 preventing rearward movement of the ratchet wheel, but allowing forward movement. Below the "tens" and "hundreds" discs 21 and in one therewith are ten-toothed cog wheels 27, 28 respectively, with which cooperate spring pressed retaining pawls 29 and 30.

For operating the "units" counter the device comprises a member 31 sliding beneath a guide bar 32, said member 31 having an arm 33 which can engage the ratchet wheel 25 of the counter, so that every time the sliding member 31 is pressed in against the action of spring 34 the "units" counter is rotated by one step, whereafter the sliding member 31 returns to its normal position under the action of the spring 34. Above the ratchet wheel 25 is provided a single tooth 35 which once in each revolution of the units disc 21, i. e. after ten steps thereof, engages with the cog wheel 27 of the "tens" counter and advances it one step. A similar single tooth 36 is provided for driving the "hundreds" counter from the "tens" counter.

In the case of a four figure counter, such as 18, it is only necessary to provide a single tooth on the spindle of the "hundreds" counter co-operating with a ten-toothed cog wheel on an additional spindle carrying a "thousands" indicating disc, a retaining pawl being of course also provided.

The manner of using the calipers will be clearly apparent from Figure 1. The lever handle 16 is pressed towards arm 3 so that the arm can freely slide along the rod 1. The arm 2 is then applied against the side of a tree and the arm 3 slidden along the rod 1 until it contacts with the other side of the tree. If the tree is an exact number of inches in diameter the lever 14, 16 can then operate when released to clamp the arm 3 to the rod 1, whereafter the operating member 10 is pressed. If the tree is of a diameter which is not an exact number of units the lever 14, 16 cannot move, but the position of the indicating mark of opening 40 between adjacent counters is noted, so that when the arm 3 is moved outwards until the lever 16 can move to clamp the arm 3 to the rod 1, the appropriate operating member 9 or 10 may be operated, as explained above, according as the actual size of the tree is nearest to that pertaining to the counter to the left of, or beneath the indicating mark in the position in which the arm 3 has been clamped to the rod 1.

Although the invention has been primarily devised for measuring tree trunks and indicating the numbers measured of each different diameter, yet the device may obviously be used for any purpose for which it may be found useful. For example, it may be used, or adapted for use, for measuring and indicating stocks of cut timber, or stocks of machine shafting, or the like. In fact it may be used for recording stocks or quantities of any articles the size of which can be measured by calipers.

What I claim is:—

1. In a registering tree caliper device, the combination of a rod-like member, a plurality of independent counters carried side by side at measured intervals along said rod-like member, a movable arm extending at right angles to said rod-like member, and having one end portion slidably mounted thereon, said arm being adapted to be moved into position against a tree, and a pair of parallel plungers carried by said arm, positioned to actuate said counters when alined therewith by sliding movement of said arm, either of the same being operable to actuate any of said counters when alined therewith, said arm having an opening therethrough through which the counters passed over by said arm, as it moves into adjusted position, may be seen, and also having an identifying mark adjacent to said opening, whereby the position of said mark rela-

tive to adjacent counters may be noted, when said arm is in adjusted position, and either of said plungers then moved into alinement with the nearest counter and operated, in accordance with the position of said mark relative to said counters.

2. In a registering tree caliper device, the combination of a rod-like base member, a plurality of independent counters carried side by side along said base member, a movable arm extending at right angles to said base member and having one end portion thereof slidably mounted thereon, a total counter carried by said arm, a counter-actuating member carried by said arm, adapted, on being alined with any of said independent counters, to be pressed into operative connection therewith to operate the same, and means contacted by said actuating member, on every actuation thereof, to additionally operate said total counter.

3. In a registering tree caliper device, the combination of a hollow rod, a plurality of independent counters carried side by side within said rod, said rod having openings through the shell thereof alined with said counters, a movable arm extending at right angles to said rod and having one end portion thereof slidably mounted thereon, a total counter carried by said arm, a counter actuating plunger carried by said arm adapted, on being alined with any of said openings, to be pressed into operative connection with the alined counter to operate the same, and means contacted by said plunger, on every actuation thereof, to additionally operate said total counter.

4. In a registering tree caliper, the combination of a rod like member, a plurality of independent counters carried side by side along said member, a movable arm extending at right angles to said member and having an end portion slidably mounted thereon, a total counter carried by said arm, an actuating plunger therefor carried by said arm, and two parallel plungers carried by said arm adapted, on being alined with any of said independent counters, to be pressed into operative connection therewith to operate the same, said plunger for actuating the total counter being positioned and adapted to be operated by actuation of either of said two parallel plungers.

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