July 10, 1923. 1,461,392

O. INGSTEAD

COMBINATION TOOL

Filed Nov. 4, 1921

Fig. 1.

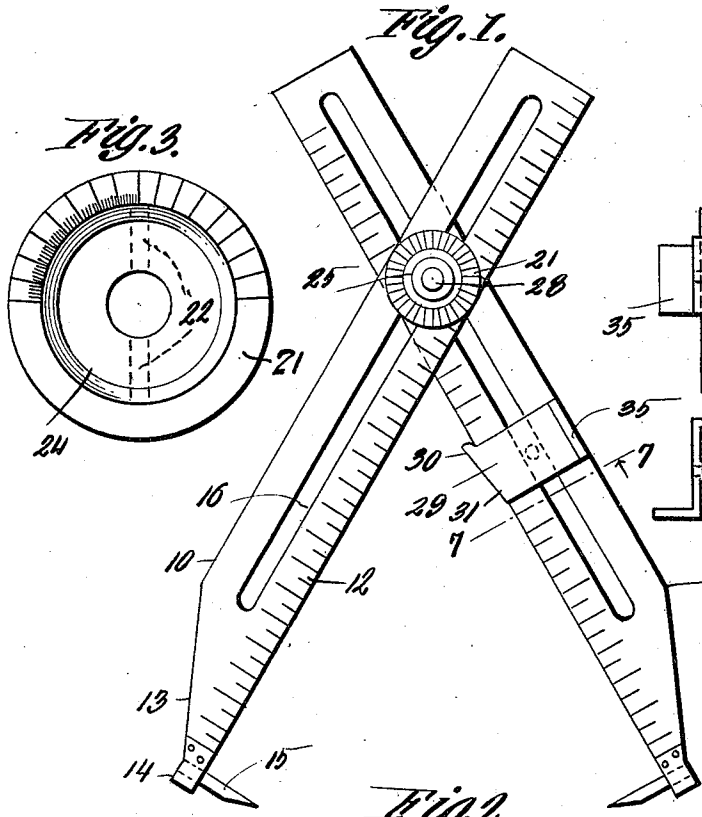


Fig. 3.

Fig. 6.

Fig. 7.

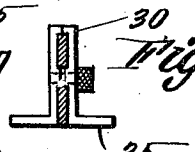


Fig. 8.

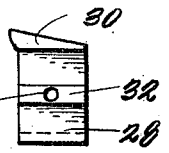


Fig. 2.

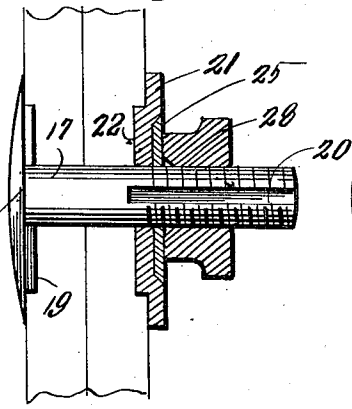


Fig. 4.

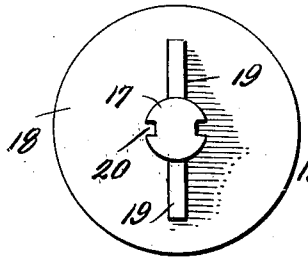
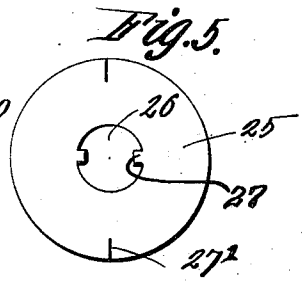


Fig. 5.



WITNESSES
Guy M. Spring
Louis W. Helmuth.

Inventor
O. INGSTEAD

By Richard B. Owen
Attorney

Patented July 10, 1923. 1,461,392

UNITED STATES PATENT OFFICE.

OLE INGSTEAD, OF LOWELL, MASSACHUSETTS.

COMBINATION TOOL.

Application filed November 4, 1921. Serial No. 512,881.

To all whom it may concern:

Be it known that I, OLE INGSTEAD, citizen of Norway, residing at Lowell, in the county of Middlesex and State of Massachusetts, have invented certain new and useful Improvements in Combination Tools, of which the following is a specification.

This invention relates to new and useful improvements in combination tools of the measuring type, the primary object of the invention being to provide a combined straight edge, calipers, depth gage, square and protractor.

Another object of the invention is to provide a device of the above nature including an arrangement and construction of the various parts whereby the tool may be quickly transformed into any of the above mentioned instruments, the construction of the various parts rendering the device exceedingly inexpensive to manufacture.

Another important object of the invention is to provide a tool including a pair of pivoted arms which may be retained in secure adjusted relationship and a member movable along one of the arms which acts as a stop and cutting element, and is capable of being set at the desired point on the arm for gaging the distance between the free ends of the arms.

Other objects and advantages of the invention will become apparent during the course of the following description.

In the accompanying drawings forming a part of the description and wherein like numerals are employed to designate like parts throughout the several views,

Figure 1 is a plan of the invention,

Figure 2 is an enlarged fragmentary longitudinal section through the device at the point of articulation of the two arms,

Figure 3 is a plan of the dial associated with one of the arms,

Figure 4 is an end elevation of the bolts for pivoting the two arms together,

Figure 5 is a plan of a plate associated with the dial but rotatable independently thereof,

Figure 6 is a fragmentary side elevation of one of the arms carrying slide or setter,

Figure 7 is a transverse section thereof, and

Figure 8 is a bottom plan of a portion of the slide.

Referring to the drawings wherein for the purpose of illustration is shown the preferred embodiment of my invention, the numerals 10 and 11 designate a pair of arms or straight edges which are identically of the same construction, each being equipped along its inner margin with graduations 12 designating inches and fractions thereof. On the reverse side of these inner marginal edges, the arms are also provided with a plurality of graduations designating preferably, inches and fractions thereof. The graduations on one arm range from one to six inches and on the other arm from seven inches to twelve inches so that when both arms are disposed in alinement, they will constitute a one foot rule. The graduations on the opposite sides of the arms range from one to six inches on both arms. One end of each arm is perfectly square while the opposite end tapers as at 13 from one longitudinal edge of the arm, the extremity of the tapered portion being equipped with a small tip or block 14 which extends in longitudinal alinement with its respective arm. Each block 14 is equipped with a transversely extending opening which is of such configuration as to receive a removable pointed shank 15. However, the fit of the shanks 15 within their socket members is of such a nature as to render the tips easily removable when such removal is desired. Each arm is also provided with a longitudinally extending slot 16 which is disposed equal distance from the longitudinal edges of the arm and extends from a point adjacent one end to a point arranged in close proximity to the opposite or square end.

In order to pivot the two arms, a bolt 17 is provided which is equipped with an enlarged head 18, the under side of which is provided with a pair of diametrically extending projections or ribs 19 which meet the shank of the bolt at their inner ends. These ribs 19 are adapted for reception in and sliding movement in the slot 16 of the arm 11 so as to prevent the bolt from turning movement. The outer end of the shank of the bolt is screw threaded as clearly seen and this threaded portion which is adapted to project beyond the co-acting arm of the tool is equipped with a pair of diametrically disposed grooves 20 for a purpose which will be presently described.

The dial used for determining the angular relation of one arm of the tool to the other, consists of a disk 21 having a central aperture therein whereby it may be posi-

tioned upon the bolt and associated with the arm 12. The under face of the disk is, like the head of the bolt, equipped with a pair of ribs or projections 22 arranged to extend diametrically across the disk and adapted for reception in the slot 16 of the arm 10. It will of course be obvious that the width of the projections 23 is such as to permit them to slide freely in the slot 16. The outer face of the disk 21 is provided with a central circular countersunk portion 24, the walls of which are beveled or flared outwardly toward said face of the disk. The margin of this dial on the portion thereof arranged between its outer edge and the edge of the recess 24 is equipped with a plurality of radiating lines indicating various angles, it being noted that the graduations are read from the edge of the recess 24.

A plate 25 circular in configuration is equipped with a central aperture 26 as seen in Figure 5, a pair of diametrically disposed lugs 27 being extended from the edge of the opening to cooperate with the grooves 20 in the end of the bolts. The outer edge of this plate is beveled to fit within the countersunk portion of the dial whereby the relative outer faces of the dial and plate are flush and the two elements will cooperate to form an accurate means for determining the angular relationship of the two arms, it being understood that the plate at one side through its association with the bolt, turns with the arm 11 while the dial 21 turns with the arm 10. In order to facilitate reading the gage, a pair of marks or indications 27′ is disposed at diametrically opposite points on the outer face of the plate 25 adjacent its periphery to cooperate with the graduations on the margin of the dial. The plate and dial are retained in cooperative relation by means of a nut 28 which is threaded upon the bolt to bear against the outer face of the plate 25 whereby it is retained within the counter-sunk portion of the dial.

A sliding element 29 is adapted to be associated with the arm 11 so that it may be set anywhere along the arm in order that the shanks or points 15 carried by corresponding ends of the arms may be positioned the desired distance apart for use as calipers. The graduation along the arm may be used for the determination of the proper location of the slide in respect to the arm which carries the dial. This slide consists of a pair of plates both of which are of substantially the same construction and are equipped at corresponding ends with right angularly disposed projection 30, the outer edges of which are inclined as at 31 whereby the projections at one end are thicker than at the opposite ends. It will also be noted that the thicker ends of the projections 30 extends slightly beyond the longitudinal edges of the plates for abutment with the longitudinal edge of the arm 10. The inner face of each plate is equipped with a transversely extending rib 32 adapted for sliding association with the slot in the arm 11. Each plate is also provided with an opening 33 which extends through the rib thereof, but the opening is associated with one of the plates is screw threaded for the purpose of receiving the threaded shank of a set screw 34 for clamping the two plates of the slide upon the arm 11 and for attaching them. It will be noted that the head of the screw is larger than the openings 33 so that it may abut the outer face of one of the plates 28.

The opposite transverse end of each plate 29 which is disposed adjacent the outer longitudinal edge of the arm 11, is bent outwardly and laterally of the body of the plate, and in angular relation to the arm 11. These angular ends 35 of the slide are arranged flush with the outer longitudinal edge of the arm 11 to form feet whereby the arm may be set up on its longitudinal edge in using the device as a protractor for determining various angles.

To use the device as a calipers, the set screw 34 in the slide is loosened to permit the slide to be moved along the arm 11 to the point which will cause the points 15 of the arm to be disposed the proper distance apart. The set screw is then tightened and the nut 28 is loosened whereby the arm 10 is permitted to swing toward the arm until the inner longitudinal edge abuts the projections 30 of the slide. The nut 28 is then tightened to secure the two arms in angular relationship. It will therefore be obvious that when the points 15 are extended inwardly toward each other the device may be used as an outside calipers, and when the points are shifted to point outwardly of the arms to extend in opposite directions, the device may be used as an inside calipers; the tapered ends of the arms 10 and 11 respectively serving to facilitate insertion thereof into an object to be checked.

When it is desired to use the tool as a square or other angular gage so that the arm 11 may be set upon a support with the co-acting arm extended upwardly, the tool is positioned to rest upon the outer longitudinal edge of the arm 11, it being appreciated that the feet 35 of the slide will cooperate in rendering the device more stable. The nut 28 is then loosened to permit the arm to be swung to the desired angle, the exact angle being determined by movement of the dial with the arm 10 and being read in conjunction with the plate 25 which remains stationary with the arm 11. When the desired angular relationship of the arms has been obtained, the nut 28 is tightened.

The tool may also be used as a rough depth

gage by simply disposing the arm 10 at right angles to the arm 11 at a point upon the latter designating the desired depth. It will also be obvious that by loosening the nut 28 the two arms may be arranged in longitudinal alinement with each other, and by disposing the bolt in the corresponding extremities of the slots 16 to form a 12 inch straight edge or rule.

The foregoing description and accompanying drawings have reference to what might be considered to be the approved or preferred form of my invention. I desire it to be understood that I can make such changes in the construction, combination and arrangement of parts materials, dimensions, etc., as may prove expedient and fall within the scope of the appended claims.

Having thus described my invention what I claim as new and desire to secure by Letters Patent is:

1. A combination tool comprising a pair of pivoted arms each being provided with a longitudinally extending slot, articulator means extending through the slots for pivotally connecting the arms, a slide associated with one arm and including a pair of plates each having a rib mounted in the slot of its respective arm, a set screw for associating the plates with the arm, and each plate being equipped with a right angular extension which is disposed flush with a longitudinal edge of the arm with which it is associated.

2. A combination tool comprising a pair of arms each being provided with a longitudinally extending slot, a bolt associated with one of the arms in a manner to prevent turning movement with respect thereto and having its shank projected through the slot of the arm, the free end of the bolt being extended beyond the arms and equipped with threads, diametrically disposed grooves on the threaded portion of the bolt, a dial having one side provided with a rib for insertion in the slot of the arm which pivots on the bolt, the opposite face of the dial being provided with a counter-sunk portion. a plate disposed in said counter sunk portion and arranged upon the bolt and having means extending into the grooves thereof for preventing turning movement of the plate with respect to the bolt, and a nut arranged upon the bolt for abutment with said plate.

In testimony whereof I affix my signature in presence of two witnesses.

OLE INGSTEAD.

Witnesses:
RALPH ERIKSEN,
HARRY B. REED.