

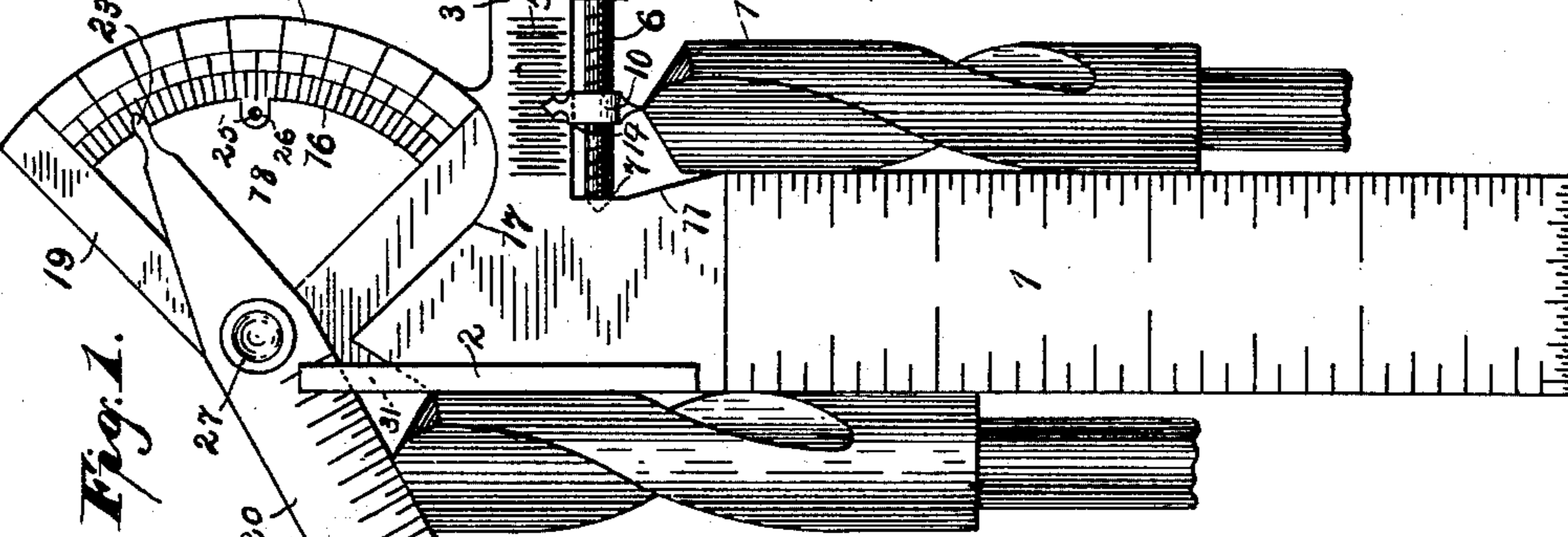
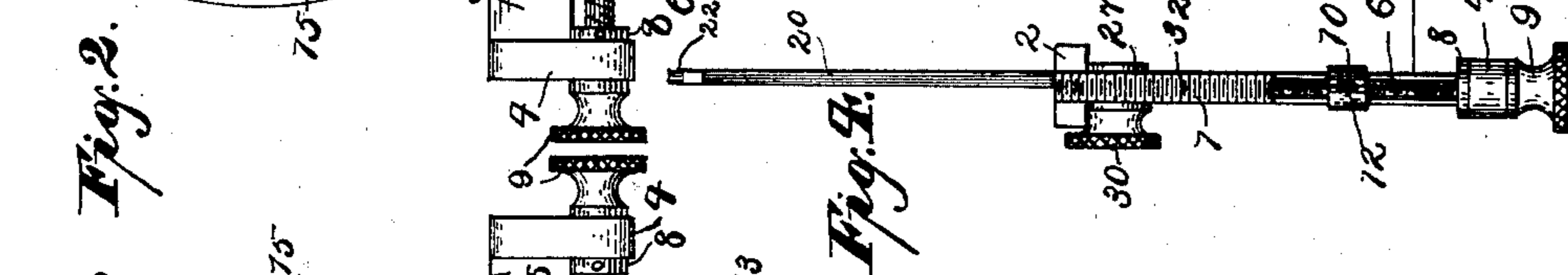
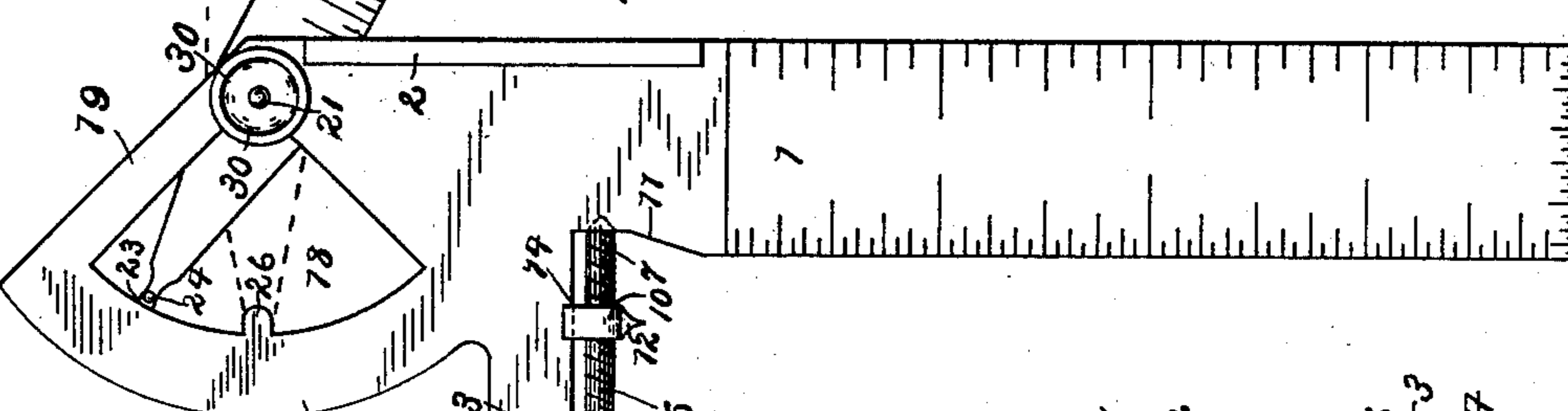
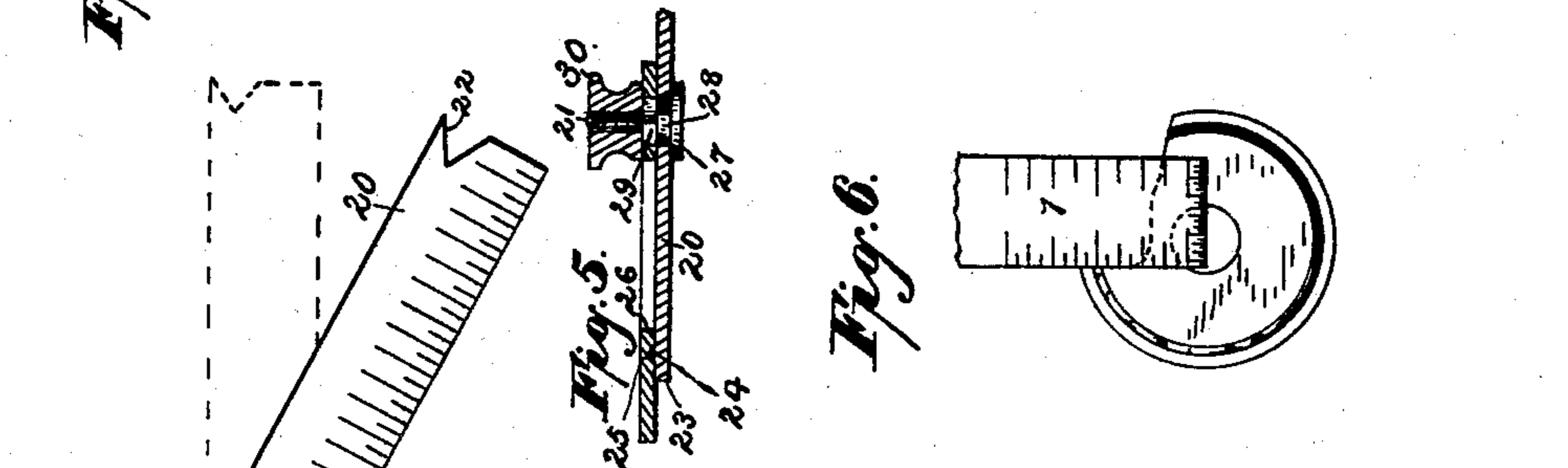
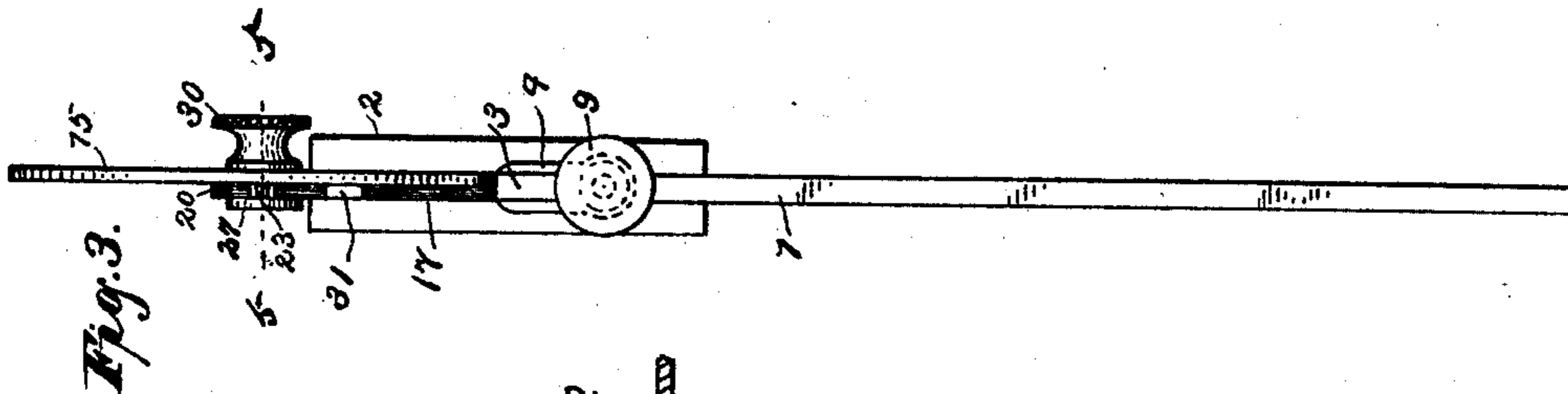
No. 609,895.

Patented Aug. 30, 1898.

C. C. A. MITCHELL.
COMBINATION TOOL.

(Application filed Jan. 17, 1898.)

(No Model.)



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UNITED STATES PATENT OFFICE.

COLONEL C. A. MITCHELL, OF INDIANAPOLIS, INDIANA.

COMBINATION-TOOL.

SPECIFICATION forming part of Letters Patent No. 609,895, dated August 30, 1898.

Application filed January 17, 1898. Serial No. 666,874. (No model.)

To all whom it may concern:

Be it known that I, COLONEL C. A. MITCHELL, a citizen of the United States, residing at Indianapolis, in the county of Marion and State of Indiana, have invented certain new and useful Improvements in a Machinist's Combination-Tool; and I do declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to the figures of reference marked thereon, which form a part of this specification.

My invention relates to improvements in combination-tools for machinists, and particularly to that class in which are combined instruments of precision, consisting of a tool-gage, scale, protractor, square, bevel-square, twist-drill gage, thread-gage, and centering-gage, in which all the elements are combined in a single tool; and my invention consists in the novel arrangement of the several parts and their peculiar construction and combination.

The object of my invention is to provide a tool of the class described in which the tool gage, scale, protractor, square, bevel-square, twist-drill gage, thread-gage, and centering-gage are all combined compactly in one instrument, thus avoiding the necessity of separate tools, and, further, to provide a tool of the class described that will be convenient, accurate, simple in its construction and application, that will be absolutely accurate for grinding drills centrally, facing work of any desired angle, and providing scales of coarse and fine graduations, all of which will be more particularly set forth in the following specification and shown in the accompanying drawings.

Referring to the drawings, Figure 1 is a top plan view illustrating the method of centering drills and gaging the bevels to which they are to be ground. Fig. 2 is a bottom plan view of the instrument. Fig. 3 is an edge view. Fig. 4 is an end view. Fig. 5 is a cross-sectional view taken on the line 5 5 of Fig. 3, and Fig. 6 illustrates the use of the tool as applied when grinding forming-tools.

In the drawings, 1 represents the rectangular body or scale portion of my invention, hav-

ing graduated scales of any degree of graduations on either side thereof. The body 1 has the lips or flanges 2 on its inner edge near the top, which may be detachable or integral therewith for the purpose of getting a greater bearing-surface when used as a drill-gage or square.

3 is an arm extending from the body opposite the lips 2, provided with a depending bearing 4 at its outer end and having a graduating-scale 5 marked upon the top side thereof. A screw 6 is revolvably mounted in the bearing 4, with its inner end pivoted into a drilled recess 7 in the edge of the body 1. The screw 6 is provided with a collar 8 to secure it in place, and has the thumb-head 9 for turning it and a gage-point 10, traveling the full length of the screw, it being understood that said gage-point is threaded to correspond with the fine threads on the screw 6 and has the needle-point on both its upper and lower ends.

It will be observed that the body portion 1 is cut away at the angle at 11 sufficiently to allow the gage-point 10 to travel the full length of the screw 6, so that when it is at the extreme inner end of the screw the point 12 will be on a direct line with the outer edge of said body 1. The object of this gage is to center the points of drills perfectly when grinding them, as illustrated in Fig. 1. For instance, if it is desired to center a five-eighth drill, the thumb-screw is turned until the top needle of the gage indicates " $\frac{5}{16}$ " on the graduations 5, and when the drill 13 is ground to a perfect center its point and the needle-point 12 will exactly coincide when the drill is placed against the edge of the body 1, and if the drill is revolved against said edge any imperfection in grinding to a center will be instantly apparent.

It will be understood that the upper end of the gage 10 is mortised at 14 to receive the extending portion 3, as indicated by the dotted lines in Figs. 1 and 2, which serves to prevent said gage 10 from turning upon the screw 6. Above the extending arm 3 and integral with the body portion 1 is a sector 15, which is provided upon its upper face with protractor graduations or degree-marks 16. This portion of the instrument is faced down to just one-half the thickness of the body por-

tion 1, all of said reduction in thickness being taken from the upper face and its extent being indicated by the lines 17. This difference in thickness is plainly seen in Fig. 3.

5 The sector-shaped end of the instrument has a triangular opening 18 in its center, leaving the portion 19 to support the outer extremity of the protractor or sector.

The scale-arm 20, which forms the square, 10 is pivoted on the protractor screw-stud 21, which is secured in the body portion directly opposite the center of the sector 16. The outer end of the scale 20 is provided with a sixty-degree thread-gage 22, and its inner or 15 opposite end has a needle-point 23 to indicate upon the scale the number of degrees the square is turned, and to the under side of the scale 20, near the point, is a small projection or teat 24, which is adapted to enter a like- 20 shaped depression 25 in the upper face of the lug 26, which extends inwardly from the center of the scale directly opposite the screw-stud 21, upon which the scale 20 is pivoted. The scale or square arm 20 is of the same 25 thickness as the sector 16 and connecting-arm 19. Therefore the combined thickness of both parts exactly equals the thickness of the body portion 1. The purpose of the sixty-degree thread-gage is to provide a gage for grinding 30 thread-cutting tools, sixty degrees being the standard thread-gage. The screw-stud 21 is provided with the head 27, a rounded portion 28, which coincides in its length with the thickness of the scale-arm 20, a squared portion 29, which coincides with the thickness of 35 the protractor body portion, and the reduced threaded portion 21, which receives the thumb-nut 30. The square portion 29 enters a like square opening in the protractor-body, which 40 prevents its turning, while the scale 20, having a round opening, is free to turn upon the round portion 28 adjacent to the head 27. The purpose of this construction is to prevent the screw-stud from turning when the thumb- 45 nut 30 is being tightened, and thereby prevent any possibility of the arm 20 moving after it has been set to the desired degree-mark on the scale.

It will be readily understood that the needle- 50 point 23 can be turned to any desired mark on the sector by slightly loosening the thumb-nut 30, and after it has been moved to the desired position the thumb-nut is tightened, thereby clamping the scale 20 securely. The purpose 55 of the teat 24 and depression 25 in the lug 26 is to provide an instant means for setting the scale-arm 20 to a perfect square without the necessity of carefully setting it to the degree marked on the scale, it being only necessary 60 to turn the arm until the projection 24 drops into the depression 25, when the thumb-nut 30 may be tightened without referring to the degree-marks upon the scale. It will be observed that the lip or flange 2 on the upper 65 side of the instrument is mortised at 31 to allow the arm 20 to swing around to the last

graduation upon the sector. The face of the extreme outer end of the body portion 1 is provided with a scale 32, as seen in Fig. 4, 70 the graduations thereon being of the same degree of fineness as the graduations upon the edges of said extreme end. One of the advantages of the end graduations is illustrated in Fig. 6, where the tool is applied to a forming-tool. To those skilled in the art it is 75 well known that in grinding forming-tools it is necessary in many cases to grind the opposite edges upon slightly-different planes, and as the measurements in grinding must be obtained from the tool-center it is necessary to 80 obtain the measurements directly from the edges of the central opening, and as a high degree of accuracy is necessary in this work the eye may sometimes fail to carry on a direct line from the edge graduations; but by 85 continuing the graduations across the end of the tool the line runs down directly to the edge of the opening, thereby assuring accurate measurement when the tool is applied in the manner illustrated in Fig. 6. In grinding 90 twist-drills it is essential that both lips of the drill be ground exactly alike in order to have them cut true. It is also necessary that the drill should have a certain amount of clearance and that the clearance on both lips of the 95 drill be equal. By setting the scale or arm 20 to the angle upon which it is desired to grind the drill and placing the drill shown in the position illustrated in Fig. 1 any imperfection in the grinding will be instantly apparent, and 100 by slightly turning the drill against the edge and lips 2 the amount of clearance which the drill has can be readily discerned.

I am aware that drill-gages having a pivoted arm have been used heretofore; but I am 105 not aware that a drill-gage combining the particular features shown in my invention has ever been known or used.

From the foregoing specification it will be seen that my improved combination-tool can 110 be used for gaging twist-drills, gaging drill-centers, forming-tools, facing-tools, circle cut-offs, taps or reamers of all kinds, and thread-cutting tools for machinists.

Having thus described my invention, what 115 I claim, and desire to secure by Letters Patent of the United States, is—

1. A combination-tool of the class described, having scales upon its upper and lower face and across the outer end, consisting of the 120 body portion provided with mortised lips or flanges 2 upon its inner edge, a cut-out portion 11 in its outer edge opposite said lips 2, an integral sector 15, graduated upon its upper side having the lug 26 with the depression 25, 125 and an integral arm 3 having a depending bearing 4 at its outer end and a scale 5 upon its upper side; the pivotally-secured scale-arm 20, having the thread-gage 22 upon its outer end, the pointed inner end and the teat 130 24 near said inner end; the screw 6, mounted in the depending bearing 4, and the traveling

gage-point 10, mounted upon the screw 6 and having the mortise 14 and the point 12, all as shown and described.

2. A tool of the class described, comprising
5 a body provided with coarse and fine graduations upon its upper and lower faces and graduations across its lower end, a drill-grinding gage provided with an adjustable scale-arm, a drill-centering gage provided with the
10 traveling gage-point mounted on a screw, a protractor formed by the sector 15 and arm 20, a square consisting of the arm 20 secured at right angles to the edge of the body portion and secured by clamping the teat 24 on its
15 inner end into the depression 25, formed in the lug 26, the bevel-square formed by the arm and body portion, and the sixty-degree thread-gage formed in the outer end of the scale-arm, all as shown and described.

20 3. In a machinist's combination-tool, the combination of the body 1, having the graduated scales upon the sides and across the outer end thereof, for obtaining measurements in tool-grinding, the cut-out portion 11, the
25 flanges or lips 2, on its inner edge, having the mortise 31, and the extending arm 3, carrying the depending bearing 4, and having the scale 5; the sector 15, having the scale 16, and the inwardly-extending lug 26, and the connecting
30 portion 19, said sector and connecting portion being of half the thickness of the body portion and integral therewith; the drill-

grinding gage formed by the inner edge of the body portion, the scale-arm 20, and the lips 2; the scale-arm 20 adapted to form in con- 35
nection with the other parts of the tool, a square, a bevel-square, and protractor, consisting of the arm pivoted upon the screw-stud 21, opposite the center of the sector, said arm having the point 23 at its inner end with 40
a teat 24 upon one side of said point and having a sixty-degree thread-gage 22, formed in its opposite end; the means for securing the scale-arm consisting of the screw-stud 21, having the head 27, the round portion 28, adapted 45
to enter the like opening in the scale-arm 20, the square portion 29, adapted to enter a square opening in the body portion, and the thumb-nut 30, adapted to mesh with the screw-stud 21; and the drill-centering device, 50
consisting of the screw 6, secured in the bearing 4, and the drilled recess 7, by the collar 8, and adapted to be revolved by the thumb-head 9, said screw carrying the traveling gage-point 10, said gage-point being mortised at 14 55
to slide upon the arm 3, all substantially as shown and described.

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

COLONEL C. A. MITCHELL.

Witnesses:

C. S. FRYE,
L. NATHAN.