W. R. COLEMAN.

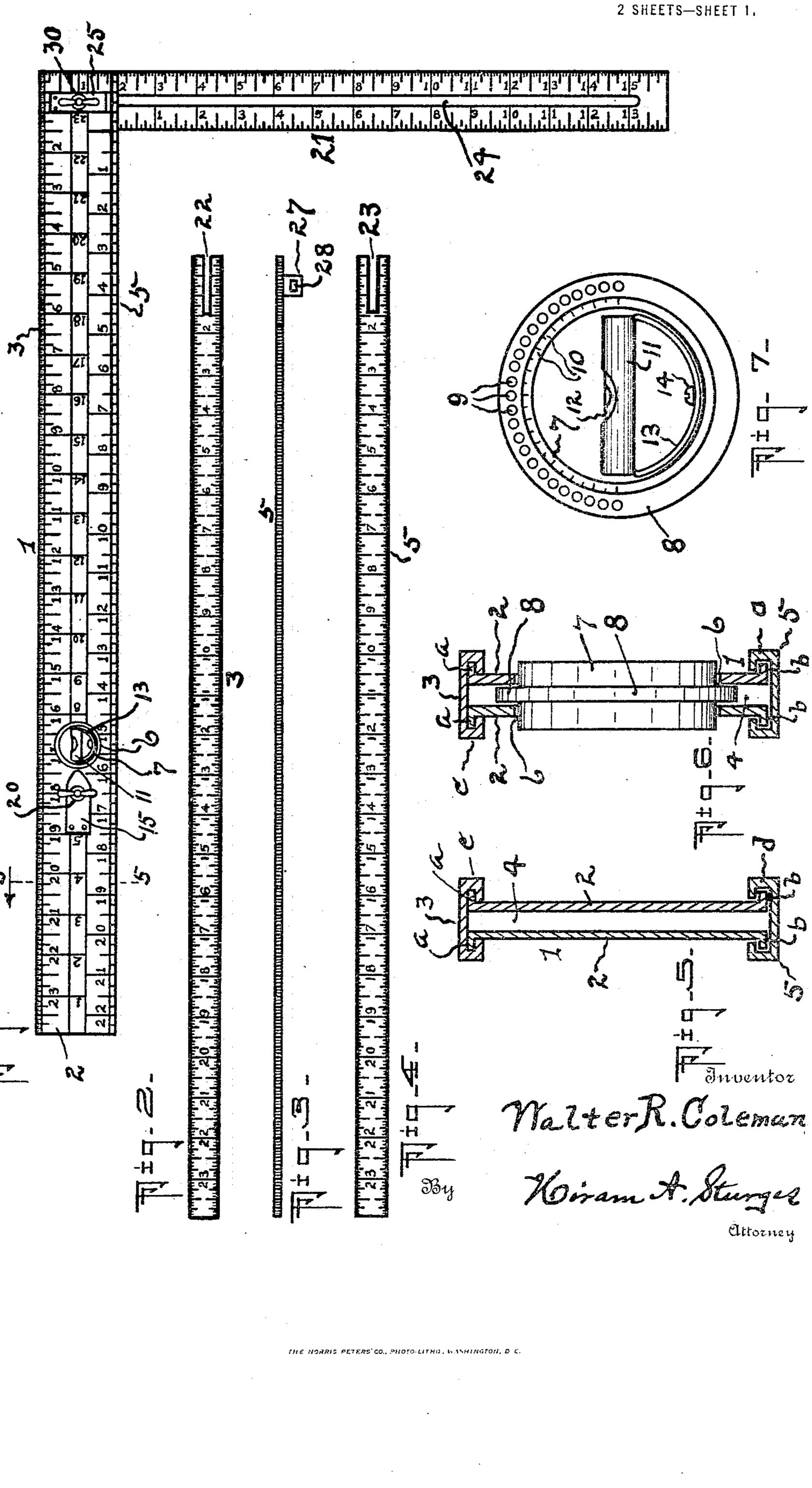
COMBINED FOLDING SQUARE AND LEVEL.

APPLICATION FILED JUNE 18, 1917.

1,298,010.

Patented Mar. 25, 1919.

2 SHEETS—SHEET 1.



Inventor

Walter R. Coleman

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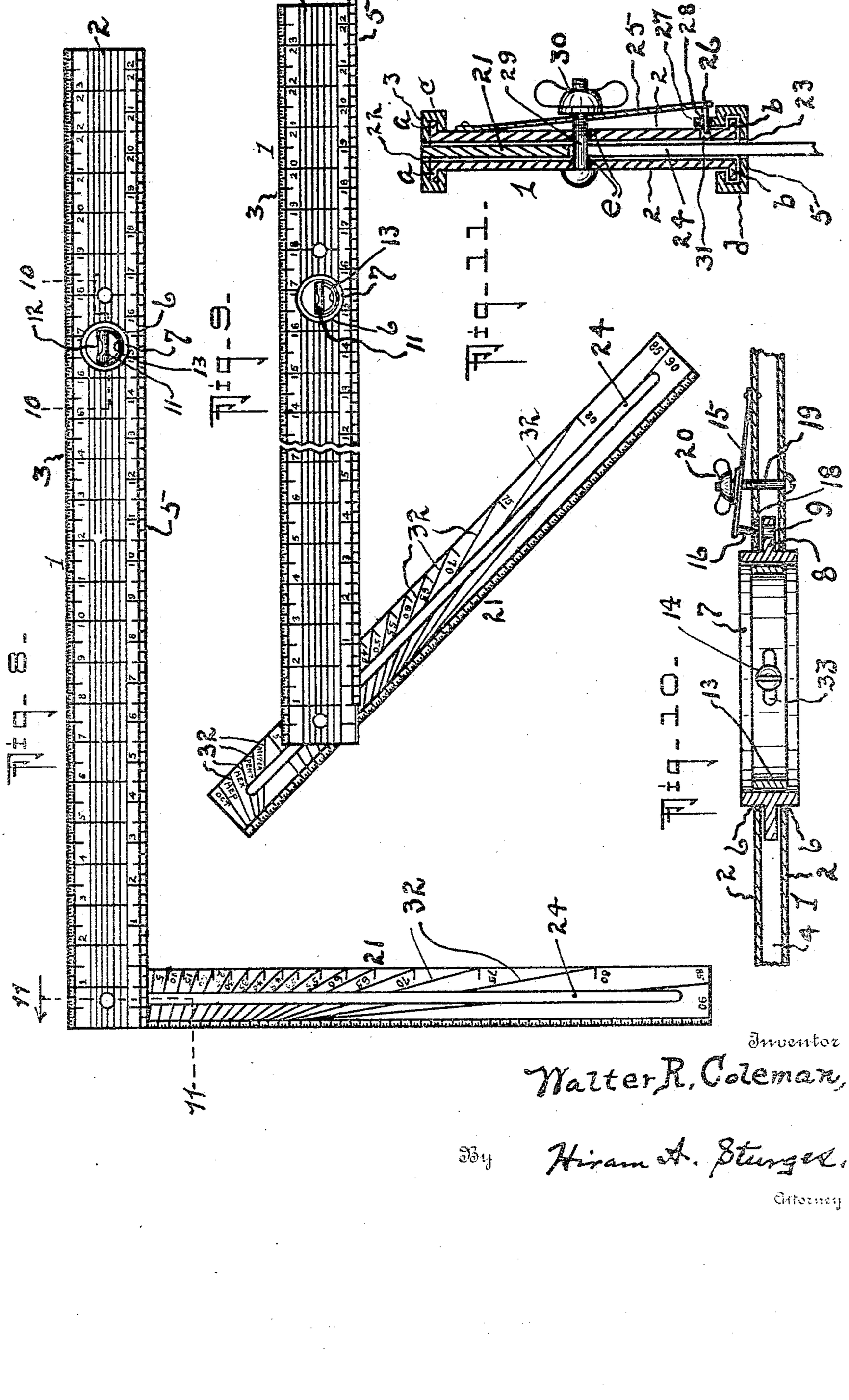

Inventor

Walter R. Coleman,

By Hiram A. Sturges.

Attorney

UNITED STATES PATENT OFFICE.

WALTER R. COLEMAN, OF OMAHA, NEBRASKA, ASSIGNOR OF ONE-HALF TO ANTHONY E. ALBERTER, OF OMAHA, NEBRASKA.

COMBINED FOLDING SQUARE AND LEVEL.

1,298,010. Specification of Letters Patent. Patented Mar. 25, 1919.

Application filed June 18, 1917. Serial No. 175,281.

To all whom it may concern:

Be it known that I, WALTER R. COLEMAN, a citizen of the United States, residing at Omaha, in the county of Douglas and State of Nebraska, have invented certain new and useful Improvements in Combined Folding Squares and Levels, of which the following is a specification.

This invention relates to a combined folding square and level, and has for its object, broadly, to provide a tool which will be convenient in use for a variety of purposes and will consist of few and simple parts so that it may be economically manufactured.

One of the specific objects of the invention is to provide an attenuated, rectangular, graduated frame which may be used as a straight edge, or as a measuring stick, or as a level. Another object is to provide a tool which may be used as an ordinary carpenter's square, and another specific object is to provide such a construction that acute or obtuse angles may be readily determined.

The invention also has reference to the provision of a graduated slide for measuring objects which have a greater length than the length of the frame, and which will cooperate with other parts in maintaining a graduated blade in fixed, adjusted relation with the frame when the parts are arranged for a carpenter's square, and has reference to certain means for making adjustments of the level.

With the foregoing objects in view and others to be mentioned hereinafter, the invention presents a novel construction, combination and arrangement of parts as described herein and claimed, and as illustrated in the accompanying drawing, wherein,—

Figure 1 is a view of the device arranged as a carpenter's square. Fig. 2 is a plan view of the graduated cap for a rigid mounting on one edge of the frame. Fig. 3 is an edgewise view of a graduated slide, and Fig. 4 is a plan view of the same. Fig. 5 is a transverse section through the frame on line 5—5 of Fig. 1. Fig. 6 shows a side view of a housing-ring for containing a leveling-bulb, the graduated frame being in transverse section. Fig. 7 is an end view of the housing-ring for the bulb.

Fig. 8 is a view showing the reverse side of the device. Fig. 9 is a broken away detail showing the parts arranged for use when determining angles. Fig. 10 is a sectional view through the housing-ring, the section being taken longitudinally through a part of the frame on line 10—10 of Fig. 8. Fig. 11 is a sectional view on line 11—11 of Fig. 8, to show a means for locking the graduated blade when it is disposed at right angles to the frame.

Referring now to the drawing, I provide an attenuated, rectangular graduated frame 1, consisting, in part, of the pair of metallic strips 2, uniform in length and of the same width, each being provided with outwardly projecting flanges at its edges, indicated at *a* and *b*, best shown in Figs. 5 and 6. At 3 is indicated a graduated cap having the same length as the strips 2, said cap being provided with angular flanges *c* near its edges, said flanges *c* being disposed outwardly of the flanges *a* and rigidly secured thereto by any suitable means, and thereby providing a frame substantially of I-shape in cross-section having a channel 4 opening upon its ends and one longitudinal edge. Numeral 5 indicates a graduated slide similar to the cap 3, its angular flanges *d* being mounted to permit longitudinal movements on the flanges *b*, said slide having the same length as the strips 2.

The strips 2 are provided, adjacent to one of their ends with circular openings 6 in which is inserted a housing-ring 7 provided with a circular flange 8 which is disposed between the side strips 2. Numerous apertures 9 are formed in the flange 8, these being disposed in an arc, substantially of 180 degrees, the ends of the ring 7 bearing suitable indices or characters 10, corresponding to the apertures 9. Numeral 11 indicates a suitable holder for the conventional transparent leveling bulb 12, said holder being provided with a segmental base-strip 13 adapted to be disposed within the ring 7 and being secured thereto by a set-screw 14; and it will be understood that the ring 7 may be manually rotated to dispose the bulb at any desired angle with reference to the longitudinal axis of the frame. Means are provided for maintaining the bulb at any selected angle, consisting of the spring 15 provided with a tapered pin 16, said spring being mounted on the side of one of the strips 2, its pin being adapted to engage in an aperture 9 of the flange 8 after an adjustment of the level

has been made, said pin entering an aperture 9 after traversing an aperture 18 formed in a strip 2, a screw 19 and wing-nut 20 being used for this purpose.

Numeral 21 indicates a graduated blade, bearing on its respective sides any suitable lines or marks to indicate acute or obtuse angles or for determining lineal measurements, as best shown in Figs. 8 and 9. By referring to Figs. 2 and 4, respectively, it will be seen that the cap 3 is provided with a recess 22 opening on one of its ends, the slide 5 also being provided with a similar recess 23, the length of the recesses being equal to the width of the graduated blade 21.

The blade 21 is provided, midway between its longitudinal edges, with a slot 24, terminating adjacent to its ends. The strips 2 are provided, near one of their ends, with apertures *e* (Fig. 11). Numeral 25 indicates a spring-latch which is secured at one of its ends upon the side of a strip 2, its lug 26, at its opposite end, preferably being angular in cross-section.

The slide 5 is provided on one of its sides, adjacent to its recess 23, with an ear or plate 27 having an aperture 28 formed therein, to operate as a catch-member, said aperture being angular in plan, for receiving therein the lug 26 of the spring-latch.

By means of the screw 29 which is disposed in apertures *e* and threaded in the wing-nut 30, the spring-latch 25 may be pressed downwardly so that its lug 26 may enter the aperture 28, and also may enter a corresponding aperture 31 formed in a strip 2, which prevents any longitudinal movement of the graduated slide 5 with reference to the strips 2.

It will be seen that any swinging movement of the blade 21 from a right angle to the frame will be prevented after the lug of the latch 25 enters the aperture 28, since a longitudinal movement of the slide will then be prevented by the lug 26, and one of the edges of the blade 21 will be disposed in engagement with the end walls of the recesses 22 and 23, a third bearing for the blade 21 being provided by the screw 29 engaging in one end of the slot 24 of said blade.

When it is desired to use the device for the measurement of angles, the wing-nut 30 is rotated to permit the lug 26 to move outwardly from the aperture 28 of the plate 27 of the slide 5, and from the aperture 31 of the strip 2. The slide is then moved longitudinally and outwardly of the frame to permit the blade 21 to be disposed transversely of the frame and at any desired angle indicated by the lines 32, best shown in Fig. 9, and, as is obvious, either acute or obtuse angles may be readily determined by use of the device. It will be noted that when the slide 5 has been moved outwardly, the blade 21 may bear upon and be supported by the end wall of the recess 23, and that the slide provides a scale or measure which may project beyond the free end of the frame.

When it is desired to use the device as a leveling implement, the blade 21 is housed in that part of the chamber 4 between the leveling device and one end of the frame. Numeral 33 indicates a slot which is formed in the segmental base-strip 13, to permit adjustments to be made for the bulb-holder 11.

It will be understood that in some instances the graduated blade 21 may be used in conjunction with the level in determining angles, the level indicating whether or not the blade is disposed horizontally when the frame is disposed at a required angle.

The device as described provides three scale-strips, since, in addition to members 1 and 21, the member 5, when its plate 27 has been released, may be extended by sliding it on the flanges *b*. It will be appreciated that the device may be manufactured economically since the parts are few and of simple construction. By referring to Fig. 1 it will be seen that the spring-latch 25 is disposed in line with the slot 24, when the graduated blade 21 is disposed at right-angles to the graduated frame, and when the latch is pressed inwardly, its projection 28 will enter this slot, and aid in maintaining said blade and frame at right-angles with reference to each other.

I claim:

1. In devices for the purpose described, a rectangular, attenuated, graduated frame including a pair of apertured side-strips, a graduated cap having a recess opening on one of its ends and rigidly mounted on the side-strips at one of their longitudinal edges, a graduated slide having a recess opening on one of its ends and engaging the longitudinal edges of the side-strips opposite to said cap, a graduated blade provided with a slot midway between its longitudinal edges and adapted to be disposed in the recess of the slide intermediate the side-strips, a pivot-pin traversing the apertures of the side-strips and the slot of said blade, said slide being movable longitudinally of the frame to permit the blade to be disposed at selected angles with reference to said frame, and a latch on the pivot-pin in engagement with the slide for maintaining the blade and slide in stationary relation with the frame.

2. In devices for the purpose described, a graduated frame substantially of I-shape in cross-section having a channel opening on its ends and one longitudinal edge and having a recess in its opposite longitudinal edge opening on the channel and one of its ends, a graduated slide provided with a recess opening on one of its ends and

mounted on the longitudinal edge of the frame opposite to the recess of said frame, a graduated blade provided with a slot midway between its longitudinal edges and disposed in the channel and adapted to engage in the recess of the frame and in the recess of the slide, a pivot-pin traversing the frame and the slot of said blade, means for securing the frame and slide in locked relation for maintaining said blade at right-angles to the frame, said slide being adapted to be released from its locked relation to permit it to be moved longitudinally of the frame to dispose the blade at a selected angle with reference to the frame, the end wall of the recess of the slide bearing upon a longitudinal edge of said blade.

3. In a combined folding square and level, a graduated frame provided with a circular aperture and having a channel opening on its ends and a longitudinal edge, and provided with a recess in a longitudinal edge opening on the channel and one of its ends, a graduated slide provided with a recess opening on one of its ends and mounted on a longitudinal part of the frame opposite to the recess of said frame, a graduated blade provided with a slot, said blade being disposed in the channel of the frame and adapted to be disposed in the recess of said frame and in the recess of the slide, a level mounted in the circular aperture of the frame and arranged to be adjusted to a position angular with reference to the longitudinal axis of said frame, a pivot-pin traversing the frame and the slot of the blade, devices on the pivot-pin for securing the slide and frame in locked relation for maintaining the blade at right-angles to the frame, and means for releasing the slide from said locked relation to permit it to be moved longitudinally of the frame to permit the blade to be disposed parallel with said level, in engagement with a part of the slide.

4. In devices for the purpose described, a graduated frame having a circular aperture and provided with a channel, a housing-ring in said aperture normally adapted to be moved in a circle's arc, a leveling device movable with the housing-ring, devices for securing the housing-ring in stationary relation with the frame for maintaining the longitudinal axis of the leveling device at a selected angle with reference to the longitudinal axis of the frame, a graduated blade within said channel, said blade having a pivotal connection with the frame and adapted to have a swinging movement to be disposed parallel with the longitudinal axis of said leveling device, a graduated slide mounted on one of the longitudinal edges of the frame and adapted to have a movement for engaging said blade, and means on the frame for securing the slide in stationary relation with the frame after the slide has been moved into engagement with said blade.

In testimony whereof, I have affixed my signature in presence of two witnesses.

WALTER R. COLEMAN.

Witnesses:
HIRAM A. STURGES,
ARTHUR H. STURGES.