

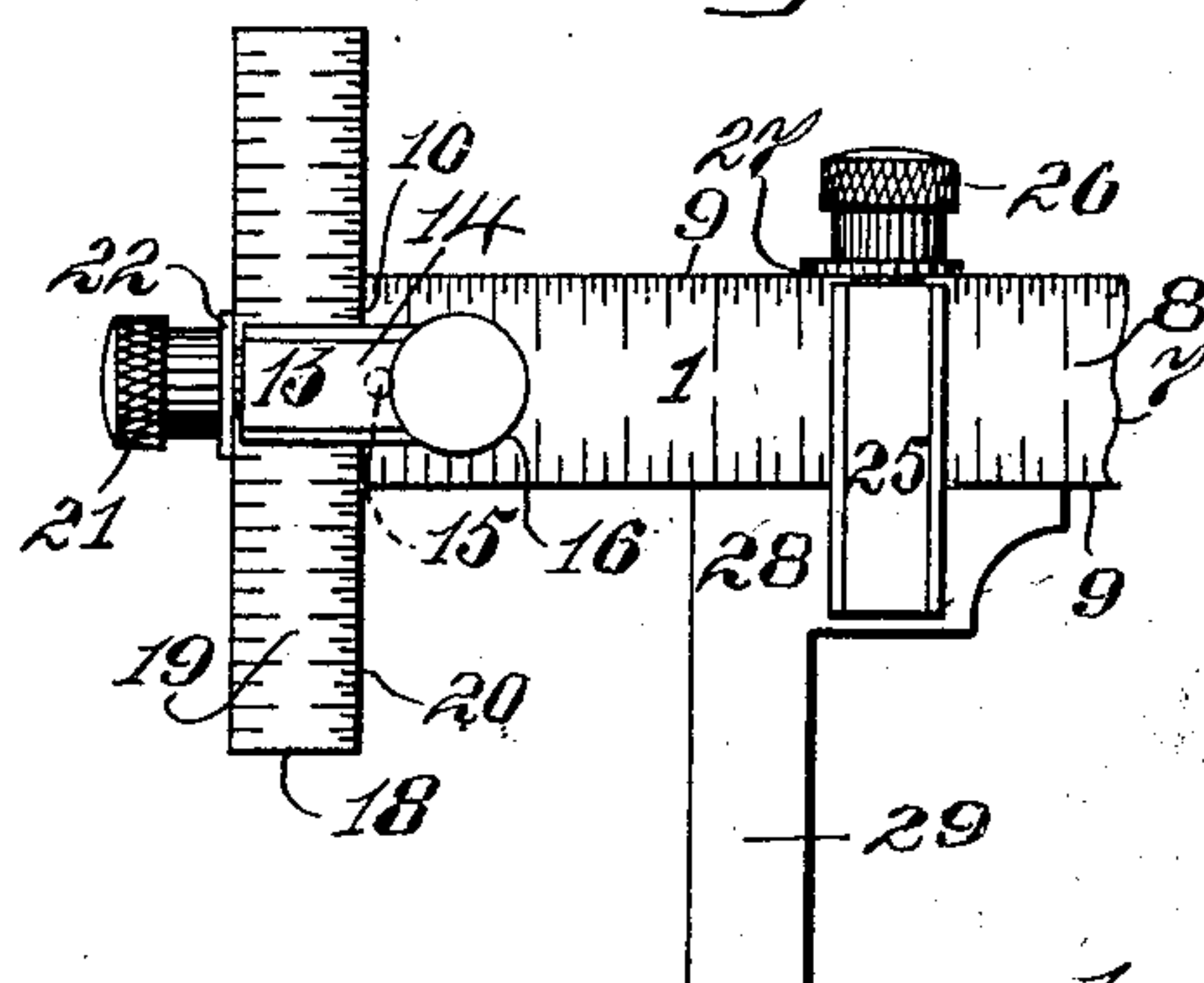
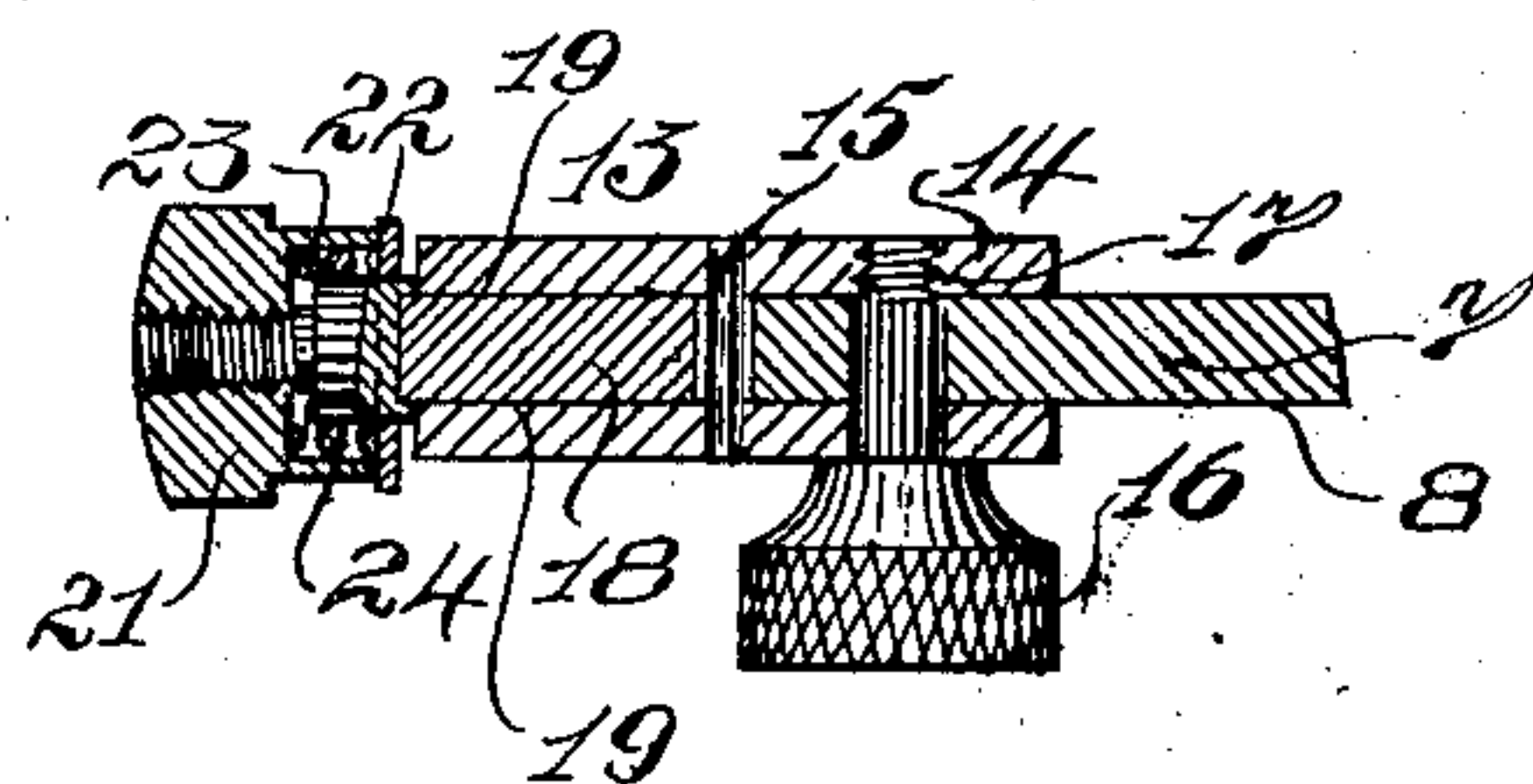
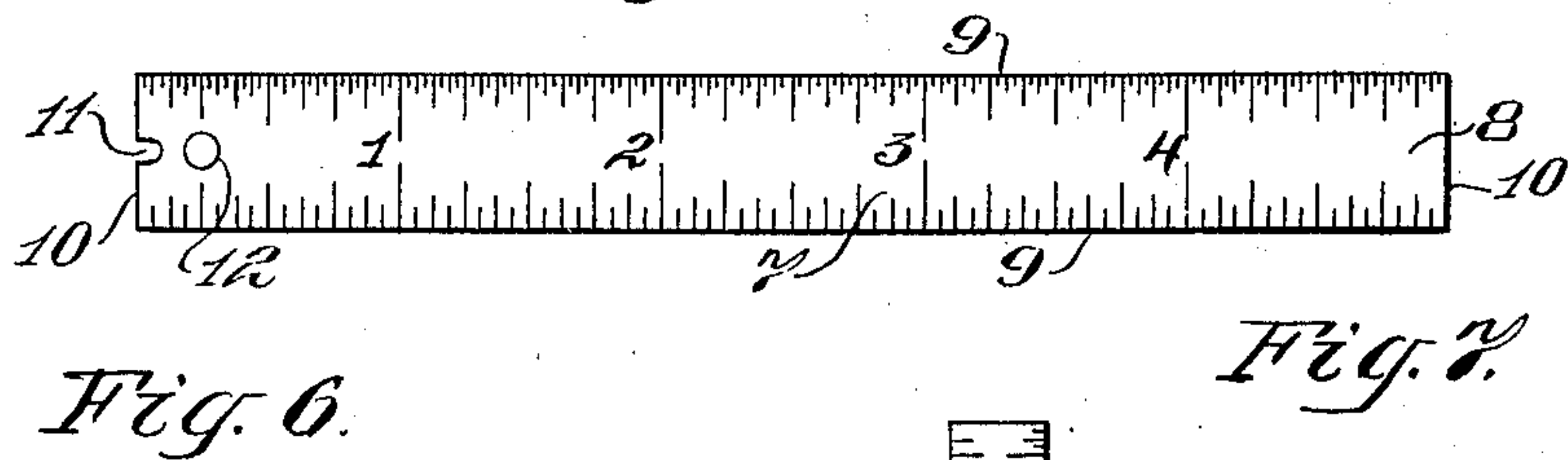
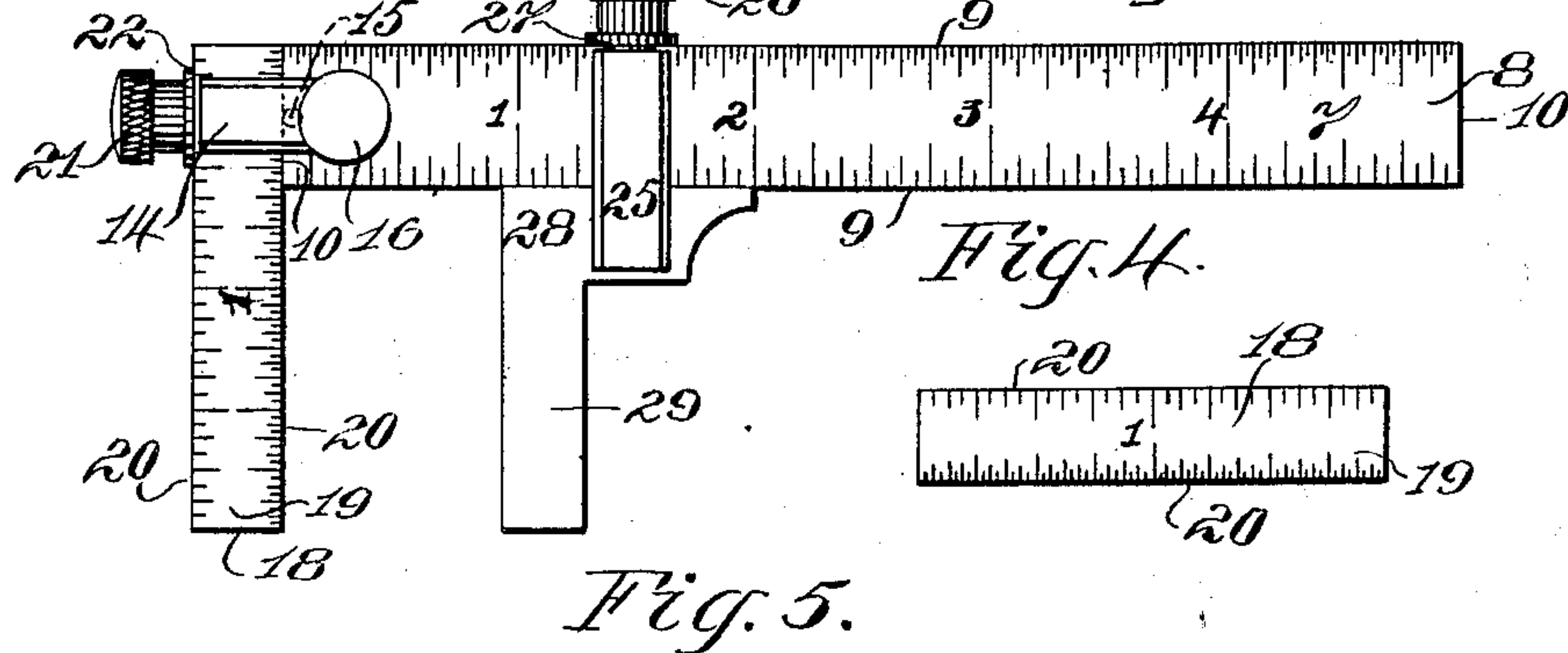
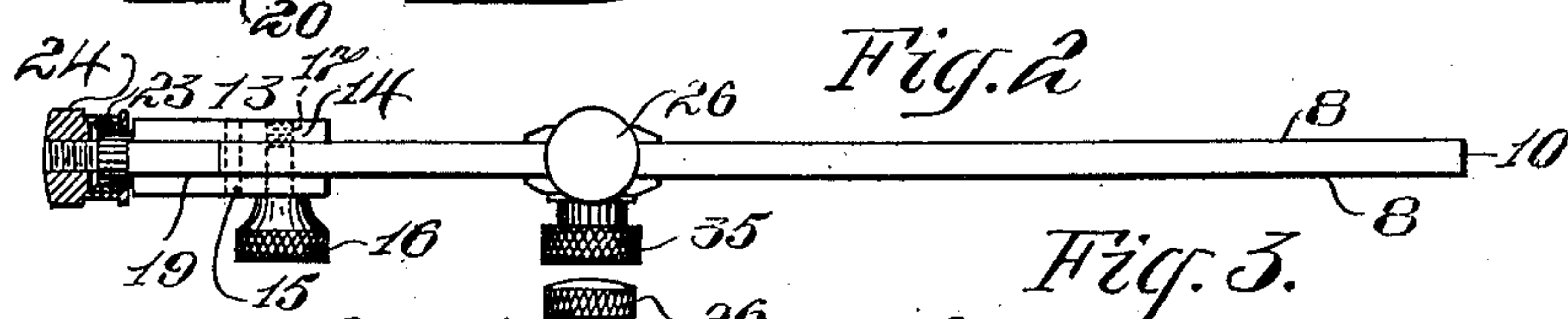
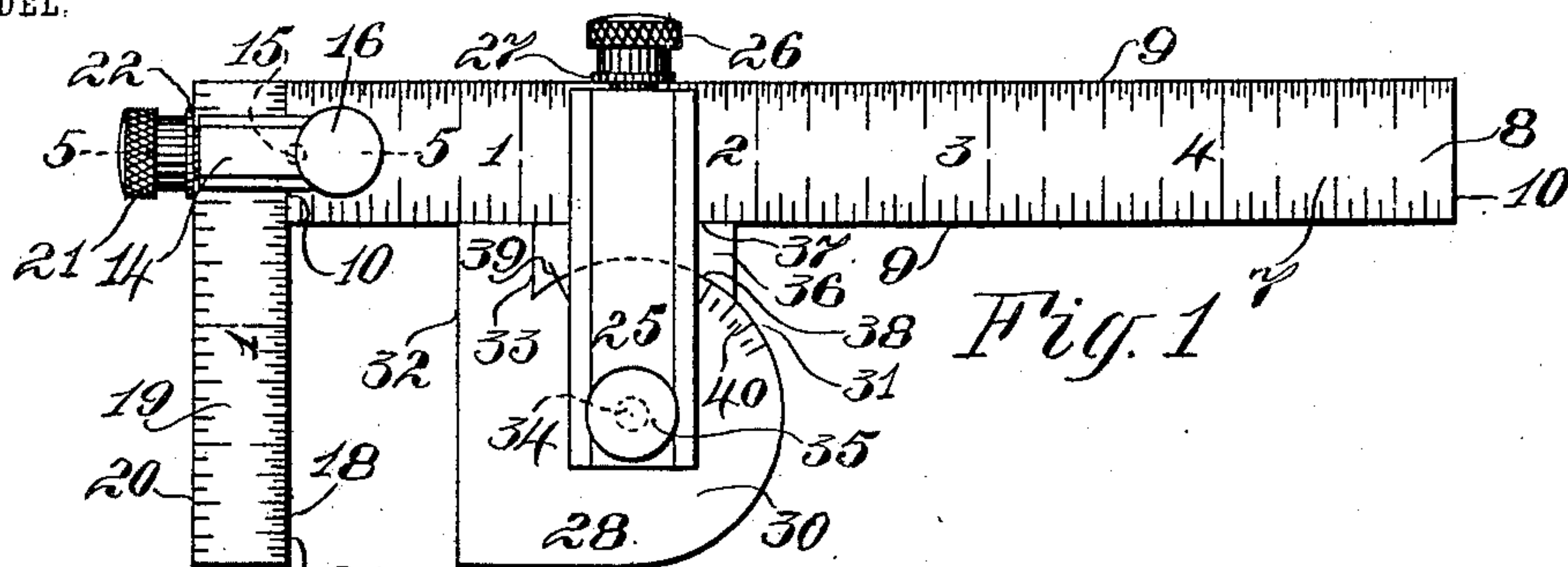
No. 735,935.

PATENTED AUG. 11, 1903.

C. E. BILLINGS.
COMBINATION MEASURING TOOL.

APPLICATION FILED FEB. 25, 1903.

NO MODEL.



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UNITED STATES PATENT OFFICE.

CHARLES E. BILLINGS, OF HARTFORD, CONNECTICUT.

COMBINATION MEASURING-TOOL.

SPECIFICATION forming part of Letters Patent No. 735,935, dated August 11, 1903.

Application filed February 25, 1903. Serial No. 144,972. (No model.)

To all whom it may concern:

Be it known that I, CHARLES E. BILLINGS, a citizen of the United States, residing in Hartford, in the county of Hartford and State of Connecticut, have invented certain new and useful Improvements in Combination Measuring-Tools, of which the following is a specification.

This invention relates to instruments of precision, and has for an object to provide a combination measuring-tool.

In the use of measuring-tools in many employments, and particularly in that of machinists, several measuring instruments of precision are generally required in a comparatively short time upon a single piece of work. In die-sinking, for instance, the workman will require a flat graduated rule, a square, a depth-gage, calipers, and frequently a short graduated scale, and in the selection of his tools and proving his work will often desire a bevel or angle gage and calipers. For economy and convenience the improvement herein presents the above tools combined in a single but separable tool, which upon separation either into its elements or into various combinations of such elements will afford the workman the various tools which he may demand.

In the drawings accompanying and forming part of this specification, Figure 1 is a side view of a form of my invention. Fig. 2 is a top view. Fig. 3 is a side view of a modification. Figs. 4 and 5 show rules which enter into the structure. Fig. 6 is an enlarged cross-section on the line 5 5 of Fig. 1, and Fig. 7 shows the instrument set as a depth-gage.

As illustrated herein the instrument is made up of a five-inch flat graduated steel rule or scale 7, having flat sides 8, straight-faced edges 9, and straight-faced ends 10, which rule constitutes the beam of the device. One of the ends of the beam-rule 7 is shown as provided with a recess or slot 11 and adjacent thereto a hole 12, which are for the purpose of securing a clamp (designated in a general way by 13) and which in the present instance comprises a strap 14, carrying a pin 15, organized to enter the recess 11, which strap also carries a set-screw 16, adapted to pass through one side of the strap and the hole

12 and take into a tapped hole 17 on the other side of the strap. The inside faces of the strap and the end face 10 constitute ways in which is mounted a rule, in the present instance a two-inch flat steel rule or scale 18 which in the present instance is shown as narrower than the rule 7, but is similarly provided with flat sides 19 and straight edges 20, one of which edges is held by the clamp against the end face 10 of the rule, upon which it is slidable or adjustable transversely of the other rule and may be clamped in position by a flanged set-nut 21, having a wear-plate or shoe 22, upon which a spring 23, located within the flange 24, bears, and on which the flange will bear to lock the parts. This much of the instrument constitutes a combination depth-gage and square, and the parts—that is, the rules—may be readily disassembled and used as such, or the device may be used as a depth-gage or as a square.

To use the device as a beam-caliper square, a clamp frame or yoke 25 is mounted to slide upon the rule 7 and is provided with a set-nut 26 and shoe 27, in the present instance similar to those carried by the clamp 13. The frame or yoke 25 carries a jaw designated in a general way by 28 and organized to mate with the rule 18, the rule and jaw constituting the jaws of a slide-caliper. The flat surfaces of both rules and the jaw 28 are shown as occupying the same plane. The instrument is shown in Fig. 1 as set for a beam-caliper square, and in some instances it may be found necessary by the workman to use at the same time the depth-gage as such and the caliper-jaw as such to save time in measuring his work, or an inspector of material or work may find that he can employ the instrument as depth-gage and caliper combined in inspecting the work that passes before him, and thus not only save time, but the multiplication of tools, which is not only annoying, but is also expensive, owing to the great accuracy with which such tools have to be made. Fig. 7 illustrates such an employment of the implement, the jaw 28 comprising a simple blade or member 29, carried by the yoke or clamp 25.

In Fig. 1 the jaw 28 is shown as normally constituted for mating on a straight line with the rule 18. Such jaw, however, is shown as

comprising a member 30, which has edges of a contour constituting a segmental portion 31, a straight-edge face 32, organized to mate with the edge face 20 of the adjustable or jaw rule, and a stop-face 33. The member 30 is mounted in the yoke 25 by a pivot 34 in the form of a set-screw having a head 35 for the purpose of locking the member in an adjusted position. A block or gib 36 is loose between the sides of the yoke 25 and has a straight-edge face 37, sliding upon the edge 9 of the longer or beam rule, and an edge 38, conforming to the sector 31. The block forms a bearing and guide for the member 30 to move upon when swinging upon its pivot. The face 33 is organized to abut against one end of the gib to hold the edge 32 of the member parallel with the edge 20 of the jaw or transverse rule. The gib is shown as having an index-mark 39 and the edge of the sector 31 as provided with a scale 40, in the present instance representing ninety degrees. The bevel or angle of various work may be ascertained and tested by this device. If the main proposition is to have the work of a certain angle irrespective of its thickness, the caliper-jaw may be set to the required degree and the yoke unclamped from the beam, so that the jaw may slide thereon, when it will be readily apparent how the instrument may be employed. It may also be used to get thickness and bevel by setting the clamp at the desired position upon the beam and setting the face of the jaw at the desired angle. The device is also useful in the selection of tools of various bevel or angle, so that the workman may gage his tools accurately in their selection.

By the removal of the clamp and shorter rule the device may be used as a bevel-gage, as will be apparent.

The transverse rule or scale and the adjustable jaw can be used in measuring stock for width and thickness, the jaws being set for one dimension and the scale used for the other dimension. The jaw may be set on the beam for one dimension and the jaw-rule transversely adjusted for the other.

Other uses will of course develop as the user familiarizes himself with the tool.

In the foregoing description of the parts of the device its uses and the work it is capable of performing have been alluded to, making a further general description of such uses and capabilities unnecessary.

Having described my invention, I claim—

1. In a beam-caliper square, the combination with a straight rule constituting the beam, of a clamp attached thereto and normally organized for disassemblage therefrom; a straight rule held by the clamp and constituting the transverse member of the square and one jaw of the caliper; a clamp mounted upon the beam-rule and normally organized for disassemblage therefrom; a jaw pivoted to the clamp, normally mating with the jaw-

rule and angularly adjustable relatively thereto; and means to secure the same in its adjusted position.

2. In a beam-caliper square, the combination with a rule constituting the beam, of a clamp attached thereto and normally organized for disassemblage therefrom; a rule held by the clamp and constituting the transverse member of the square and one jaw of the caliper; a yoke mounted upon the beam-rule and normally organized for disassemblage therefrom; a jaw pivoted to the yoke having an edge face normally mating with the jaw-rule and having a segmental edge face adjacent thereto; a gib in the embrace of the yoke and having an edge face in sliding engagement with the edge face of the beam-rule and a segmental edge face mating with the segmental face of the jaw; means to clamp the jaw in its position of angular adjustment; and an index and scale carried by the segment and gib.

3. The combination with two flat rules, of a clamp normally constituted for disassemblage to adjustably secure one rule adjacent to the face of the end of the other rule, the flat faces of both rules lying in the same plane, a clamp normally constituted for disassemblage and adjustably mounted upon said other rule, and a jaw carried by the clamp lying in the plane of said rules and organized to mate with the adjustable rule.

4. The combination with a flat metal rule having flat faces, straight-faced edges and ends, a recess and a hole adjacent to one end, of a clamp carried by such end and normally constituted for disassemblage therefrom and having a pin and set-screw organized to mate with said recess and hole respectively; a way through the clamp parallel with and closed by the end face when assembled with the rule; a shorter flat metal rule within the control of said clamp and having flat faces and straight-faced edges traversing said way with one of its edge faces abutting the end face closing the way; a clamp adjustable lengthwise of the longer rule; a jaw carried thereby; and means to adjust the face of the jaw at an angle to the face of the rule carried by the clamp.

5. In a measuring-tool, the combination with a beam, of a yoke mounted upon the beam and adjustable longitudinally thereof and normally organized for disassemblage therefrom; means to secure the yoke in its adjusted position; a member pivoted to the yoke having a straight-edge face and a segmental edge face adjacent thereto; a gib in the embrace of the yoke and having an edge face in sliding engagement with the edge face of the beam and a segmental edge face mating with the segmental face of the member; means to clamp the member in its position of angular adjustment; and an index and scale carried by the member and gib.

6. In a measuring-tool, the combination

with a beam, of a yoke mounted upon the beam and adjustable longitudinally thereof and normally organized for disassemblage therefrom; means to secure the yoke in its adjusted position; a member pivoted to the yoke having a straight-edge face and a segmental edge face adjacent thereto; a gib in the embrace of the yoke and having an edge face in sliding engagement with the edge face of the beam and a segmental edge face mating with the segmental face of the member; means to clamp the member in its position of angular adjustment; and a transverse member upon the beam organized to cooperate with the straight face of said member.

7. In a beam-caliper square, the combination with a scale having a straight edge and a straight face at right angles thereto for the edge of its end, of a jaw mounted thereon normally constituted for disassemblage therefrom, and an adjustable depth-gage having a straight face for its edge carried by the end of the beam with the edge face of the depth-gage in contact with the edge face of the end of the beam, at right angles to the edge of the beam and mating with the jaw to form the jaws of the caliper.

8. In a beam-caliper square, the combination with a beam having a straight face for the edge of its end, of a jaw mounted thereon and normally constituted for disassemblage, and a depth-gage comprising a scale having a straight face for its edge, means for adjustably holding said scale upon the end of the beam transversely thereof with its edge face in contact with the end face of the beam and to support the same from other than transverse movements.

9. The combination with two straight scales, of a clamp normally constituted for disassemblage to secure one scale upon and constantly transverse to the other to permit adjustment of the former on a line transverse to the latter and upon clamping to precisionize the constant angularity of the scales, and a jaw adjustably mounted upon one scale and mating with the other scale and normally constituted for disassemblage from the scale upon which it is mounted.

10. The combination with two straight scales, of a clamp normally constituted for disassemblage securing one scale upon and constantly transverse to the other to permit adjustment of the former on a line transverse to the latter and upon clamping to precisionize the constant angularity of the scales.

11. In a beam-caliper square, the combination with a rule constituting the beam, of a yoke mounted upon the beam-rule and normally organized for disassemblage therefrom; a jaw pivoted to the yoke having a straight-edge face and a segmental edge face adjacent thereto; a gib in the embrace of the yoke and having an edge face in sliding engagement with the edge face of the beam-rule and a

segmental edge face mating with the segmental face of the jaw; means to clamp the jaw in its position of angular adjustment; and an index and scale carried by the segment and gib.

12. The combination with a flat-sided straight-edged rule, of a clamp carried by one end of the rule within the limits of the planes of its edges and normally constituted for disassemblage therefrom and provided with a way beyond the end of the rule in the plane of its flat sides and transverse to the length thereof; and a flat-sided straight-edged rule shiftable in such way.

13. The combination with a flat graduated rule having straight faces for the edges of its sides and ends, of a clamp attached to said rule adjacent to one end and normally constituted for disassemblage therefrom, and comprising an end portion carrying a clamping device, and a pair of side members projecting from such end portion and having their opposing faces flat resting partly upon the flat sides of the rule and partly projecting beyond the faces of the end, a set-screw passing through said members and the rule, the wall comprised of such projecting faces the end portion of the clamp and the faces of the end of the rule constituting a way transverse to the edge face of the rule; a flat graduated rule having straight faces for its edges carried by and slidable through said way with one of its edge faces abutting the face of the end of the rule and one of its faces within the control of the clamping device carried by said portion.

14. The combination with a flat graduated rule having straight faces for the edges of its sides and ends, of a clamp attached to said rule adjacent to one end and normally constituted for disassemblage therefrom, and comprising an end portion carrying a clamping device, and a pair of side members projecting from such end portion and having their opposing faces flat and resting partly upon the flat sides of the rule and partly projecting beyond the face of the end, a set-screw passing through said members and the rule, the wall comprised of such projecting faces the end portion of the clamp and the face of the end of the rule constituting a way transverse to the edge faces of the rule; a flat graduated rule having straight faces on its edges carried by and slidable through said way with one of its edge faces abutting the face of the end of the rule and one of its faces within the control of the clamping device carried by said end portion, a clamp traversing the former rule; and a caliper-jaw carried thereby and organized to mate with the rule carried by the clamp.

15. The combination with a flat metal scale having flat faces, straight-faced edges and ends, a recess and hole adjacent to one end, of the clamp carried by such end and nor-

mally constituted for disassemblage there-
from and having a pin and set-screw organ-
ized to mate with said recess and hole respec-
tively; a way through the clamp parallel with
5 and closed by the end face when assembled
with the scale a shorter flat metal scale within
the control of said clamp, having the flat faces

and straight-faced edges, traversing said way
with one of its edge faces abutting the end
face.

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