A. W. MARTIN.

GAGE.

APPLICATION FILED JAN. 4, 1919.

1,351,528.

Patented Aug. 31, 1920.

2 SHEETS—SHEET 1.

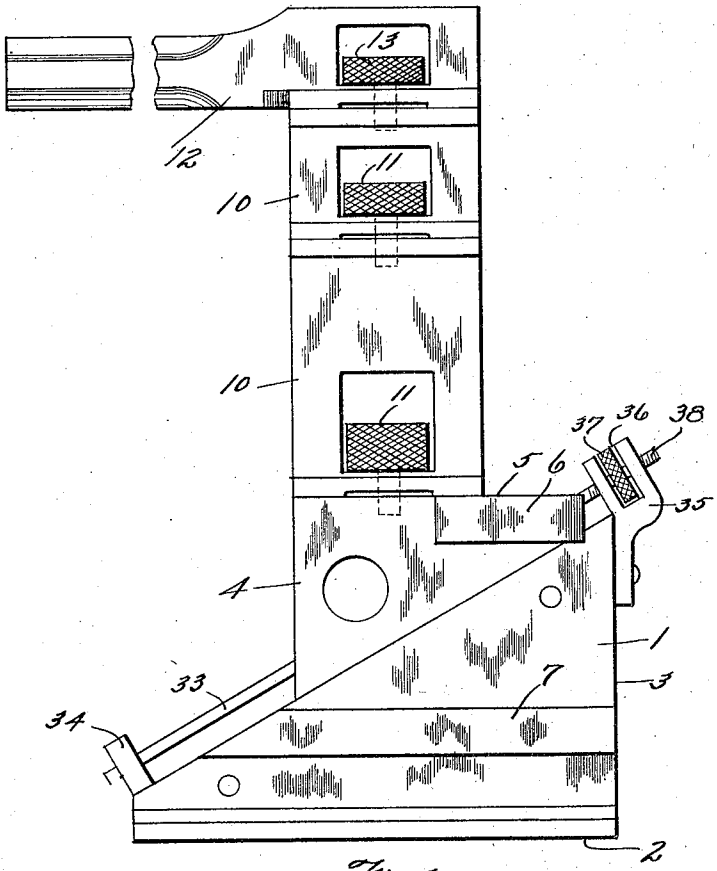


Fig. 1

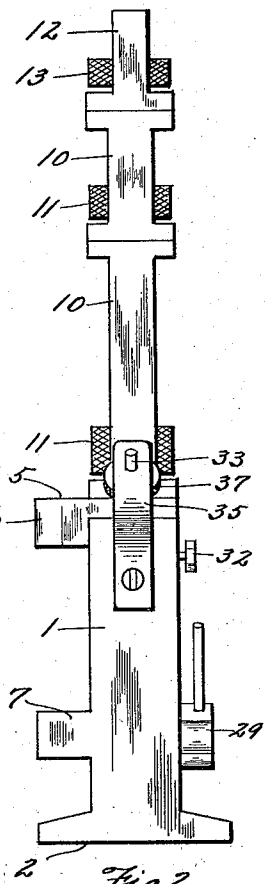


Fig. 2.

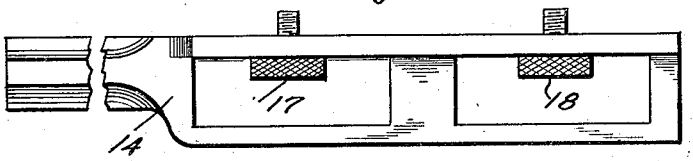


Fig. 3.

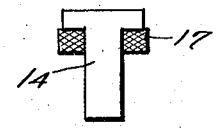


Fig. 4.

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2 SHEETS—SHEET 2.

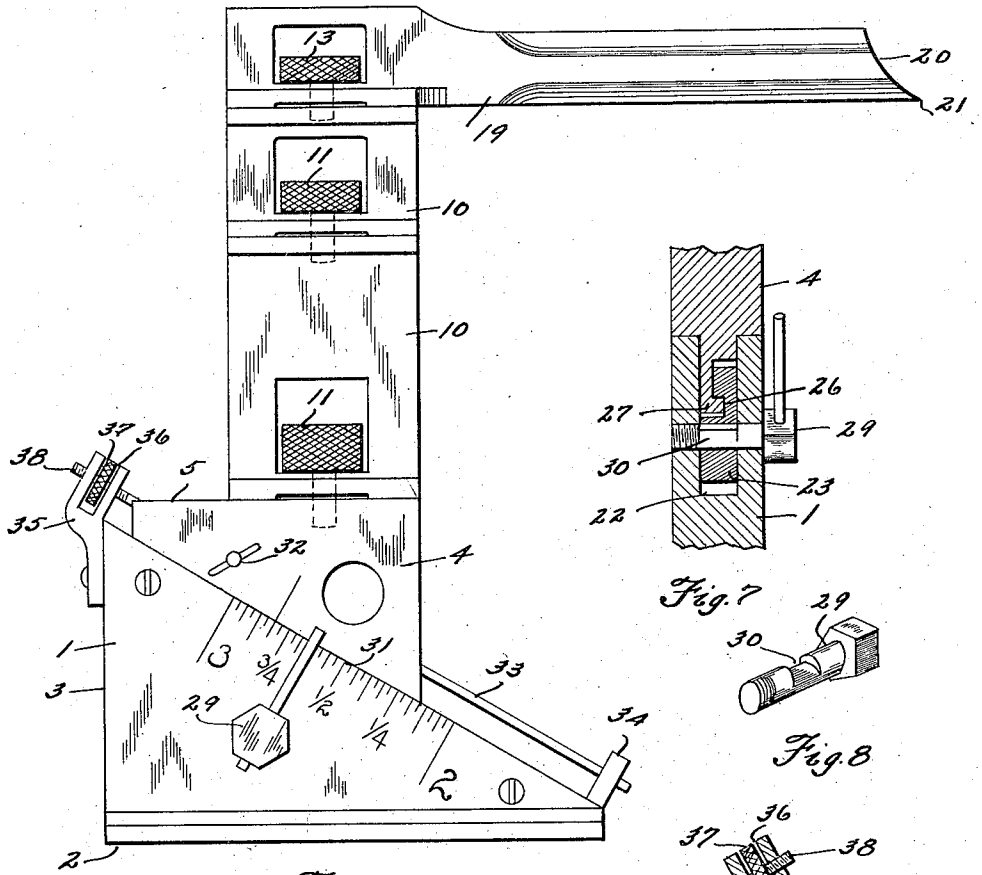


Fig. 5.

Fig. 7

Fig. 8

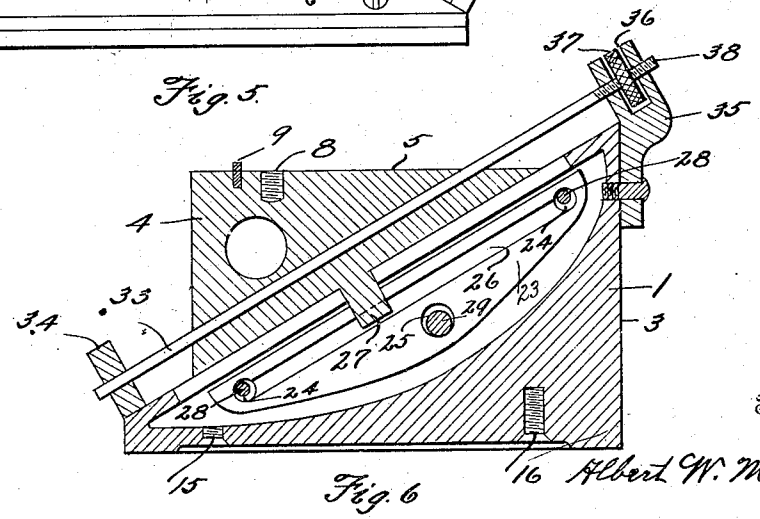


Fig. 6

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UNITED STATES PATENT OFFICE.

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GAGE.

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To all whom it may concern:

Be it known that I, ALBERT W. MARTIN, a citizen of the United States, residing at Columbus, in the county of Franklin and State of Ohio, have invented certain new and useful Improvements in Gages, of which the following is a specification.

This invention relates to gages and is designed for use particularly by machinists and tool makers where very close and minute adjustments or measurements are necessary.

In its preferred embodiment, my tool may be used as an inside or an outside gage or a height gage through a wide range of distances and at the same time being assured of extreme accuracy. The structure is also such that the gage may be rapidly set to position and to this end, I have provided a shoulder on both the triangular base member and its slide member, these shoulders being parallel with the bottom of the base member and being utilized principally for micrometer measurements.

Still a further object of my invention resides in a structure embodying two types of locking means for the slide member, both being independent of each other and one operating for the quick and temporary adjustment of the parts and the other being for very minute and accurate adjustment of the parts.

Still a further object of my invention resides in the means employed for locking the slide member to its base.

The preferred embodiment of my invention is shown in the accompanying sheets of drawings wherein similar characters of reference designate corresponding parts, and wherein—

Figure 1 is a view in side elevation of my improved type of tool with an inside or outside caliper attachment at its upper end,

Fig. 2 is an end view of the structure shown in Fig. 1,

Fig. 3 is a side view of an attachment for the bottom of the triangular base member to complete the inside and outside caliper structure,

Fig. 4 is an end view of the structure shown in Fig. 3,

Fig. 5 is a side view from the opposite side from that shown in Fig. 1 and showing a scriber attachment on the upper end,

Fig. 6 is a vertical longitudinal section through the lower portion of the tool as shown in Fig. 1,

Fig. 7 is a vertical section taken through the locking means for locking the base and slide member together, and

Fig. 8 is a view in perspective of the locking screw used by me.

In the drawing, there is shown a base member 1 of triangular form whose bottom face 2 is arranged at right angles to the rear face 3, the two faces 2 and 3 being of such length that the inclined or hypotenuse edge will serve so as to form a 30 degree angle. Slidably mounted in connection with this base member and adapted to be locked in various positions of adjustment is a slide member 4 whose top edge 5 is parallel with the edge 2. Because of the 30 degree angle, the vertical rise of the slide member 4 is just half the distance moved along the angular face of the base 1. The slide member 4 is provided with a laterally projecting shoulder 6 whose opposite horizontal faces are parallel with each other and are parallel with the bottom face 2 of the base member when parts are in the assembled relation shown. Likewise, the base member 1 is provided with a laterally projecting shoulder 7 whose top and bottom faces also are parallel with each other and with the bottom face 2. These shoulders are designed to be used in connection with the ordinary type of micrometer for effecting very minute adjustment of the parts, the base and slide member being subsequently locked together by means of a structure to be presently described. The top face 5 of the slide member is tapped as shown at 8 and is also provided with an upwardly projecting pin 9, both the tapped hole 8 and the pin 9 being designed to coöperate in holding measuring blocks, such as are shown at 10, in position. These blocks are provided with knurled screws 11 by means of which they are either attached to each other or to the slide member 4 after the manner shown in Figs. 1 and 5 and the pins 9 operate to prevent shifting or a relative twist between parts when they are assembled, it being understood that the top face of each of the blocks 10 is provided with a similar pin. When the tool is used as an inside or outside caliper, an arm of the type shown at 12 may be locked to the

uppermost section by means of the knurled screw shown at 13 and a somewhat similar arm 14 may be screwed to the bottom side of the base member which is tapped as shown at 15 and 16 to accommodate the knurled screws 17 and 18 respectively. It will be noted that the extended portions of these arms have their corners chamfered to permit the ready manipulation of the tool. This chamfered structure is shown particularly in Fig. 1. In Fig. 5, there is shown an arm 19 screwed in position in the same manner as the arm 12 but in this case, the outer extremities of the arm is cut off as shown at 20 to form a sharp edge 21 which permits the tool to be used as a scriber.

In order to lock the slide member to the base, the base is cored centrally as shown at 22 to accommodate the locking plate 23. This locking plate is of peculiar construction in that it is provided with openings 24 at its ends and an opening 25 at its center. Adjacent its top edge, it is slotted or grooved as shown at 26 to receive the hooked projection 27 carried by the hypotenuse of the slide member. Screws 28 are adapted to secure the locking plate 23 within the base member, these screws passing through one side of the base and being threaded into its opposite side. However, it will be noted that the openings 24 are slightly larger than the screws themselves which permit a slide play. A locking screw or bolt of the type shown in Fig. 8 is utilized for locking the parts in position, the opening 25 being of approximately the diameter of the screw 29 but this latter is provided with an eccentric portion 30 formed by cutting away a portion of the material as is indicated. This eccentric portion is of a width equaling the thickness of the locking plate 23 and the parts coöperate in the manner shown in Figs. 6 and 7 so that when the reduced portion 30 of the screw 29 is moved to a diametrically opposite position from that shown in Fig. 6 the locking plate is allowed to play because of its enlarged openings through which the screws 28 pass and this releases the binding action between the base and the slide member caused by the hooked portion 27 being engaged by the slotted or grooved portion 26 of the locking plate. When the screw 29 is moved to the positions shown in Fig. 6, the thumb of the eccentric portion 30 draws the locking plate down which in turn causes a pull between the locking plate and the hook 27 thus binding the base and slide member together. For such adjustments as may be determined by means of the graduations 31, the slide member may simply be unlocked and moved to the desired position and then the screw 30 again given a partial revolution to lock the parts together.

However, should it be found desirable to obtain adjustments to the thousandths part of an inch, the parts may be roughly set together as just outlined and then locked in such position not by the screw 29 but by means of the thumb screw or set screw shown at 32 in Fig. 5. This thumb screw is carried by the slide member and engages the rod shown at 33, the latter being adjustably mounted within said slide member. This rod is also slidably mounted in a bearing portion 34 at the lower end of the base member and in a second bearing portion 35 at the upper end of the base member. The head of this bearing member is milled out as shown at 36 to accommodate a knurled nut 37 having a threaded bore, these threads being designed to coöperate with the threads shown at 38 on the upper end of the rod 33. Thus, when the slide member is locked to the rod 33 by means of the set screw 32, a slight turning of the nut 37 will move the slide member along the inclined face of the base because of the threaded connection between the nut 37 and the rod 33. In this manner, very minute adjustments may be attained which may be measured by means of a micrometer operating outside the shoulders 6 and 7 or by means of the well known standard gage blocks operating between the same shoulders. When the proper adjustment has been reached, the screw 29 is tightened to securely lock the parts 3 and 4 together and the set screw 32 may then be unloosened.

From the foregoing description, taken in connection with the accompanying sheets of drawings, it will be apparent that I have provided an improved type of tool which may be used to advantage in attaining various measurements. By means of the arms shown at 12 and 14 and Figs. 1 and 3, the tool may be used as inside or outside calipers. By means of the arm shown at 12 it may be used as a height gage and similarly by means of the arm shown at 19 it may be used as a height gage as well as a scriber. Means are provided for very conveniently effecting the minute adjustment of the parts by the use of micrometers which are to be found in every machine shop. This minute adjustment may be rendered comparatively simple by the adjusting structure created by the rod 33, nut 37 and set screw 32. In addition, the slide member and base are securely locked together because of the eccentric screw structure shown in Fig. 8.

It will be noted that the hypotenuse of the right angled triangle shown is twice the length of the altitude thereof, hence it follows that accurate vertical adjustments of the slide 4 may be effected and facilitated by comparing the movements of the same with the enlarged graduations 31, the latter being of amplified length in proportion to the distances they indicate; a feature which

is rendered possible by virtue of the ratio above given between the hypotenuse and the altitude of the base member.

What I claim is:

1. In a gage, a triangular base member including a recess formed therein and an inclined edge, a slide member movably positioned upon said edge, a shouldered projection rigidly depending from said slide member and arranged to be slidably received within the recess formed in said base member, a plate adjustably located within said recesses, said plate being provided with a shoulder arranged for coöperation with said projection, and means operating to raise and lower said plate so as to release or clamp said slide member in its adjusted positions with respect to said base member.

2. In a tool of the character described, a triangular base member, a slide member slidably mounted on said base member, a vertical movable locking plate mounted within said base member to be capable of up and down movement therein toward and away from said slide, a hook carried by said slide and engaging said plate, and an eccentric pin carried by said base, said pin having its eccentric portion engaged with said plate to cause downward movement on the part of the latter.

3. In a gage, a triangular base member including a longitudinal recess and an inclined edge, a gage block slidably positioned upon said edge, a shouldered projection rigidly depending from said block and arranged to be slidably received within the recess formed longitudinally in said base member, a plate adjustably located within said recess, said plate being provided with a shouldered portion arranged for clamping coöperation with said projection, means operable to raise and lower said plates so as to release or clamp said block in its adjusted positions with respect to said base member, and threaded means operating independently of said plate to secure a final micrometric adjustment of said block.

4. In a gage, a base member including a horizontal lower edge and an inclined upper edge, an adjustable block slidably mounted upon said inclined edge, means for locking said base and block in any desired position of relative adjustment, a shoulder projecting laterally from said block and having measuring surfaces formed thereon which are located in parallelism with the lower edge of said base member, and a coöperative shoulder projecting from said base member at a position appreciably spaced from and above the lower edge thereof, said latter shoulder being provided with measuring surfaces disposed in parallelism with the surfaces of said first named shoulder.

5. In a gage, a base including an inclined edge, an adjustable slide member positioned upon said edge, height indicating means capable of being removably connected with said slide member, said means including an arm disposed to project beyond the confines of said base, locking mechanism for retaining said slide member in its adjusted positions upon the inclined edge of said base, and said mechanism operating to draw said arm downwardly when locking said slide member in conjunction with said base.

In testimony whereof I affix my signature.

ALBERT W. MARTIN.