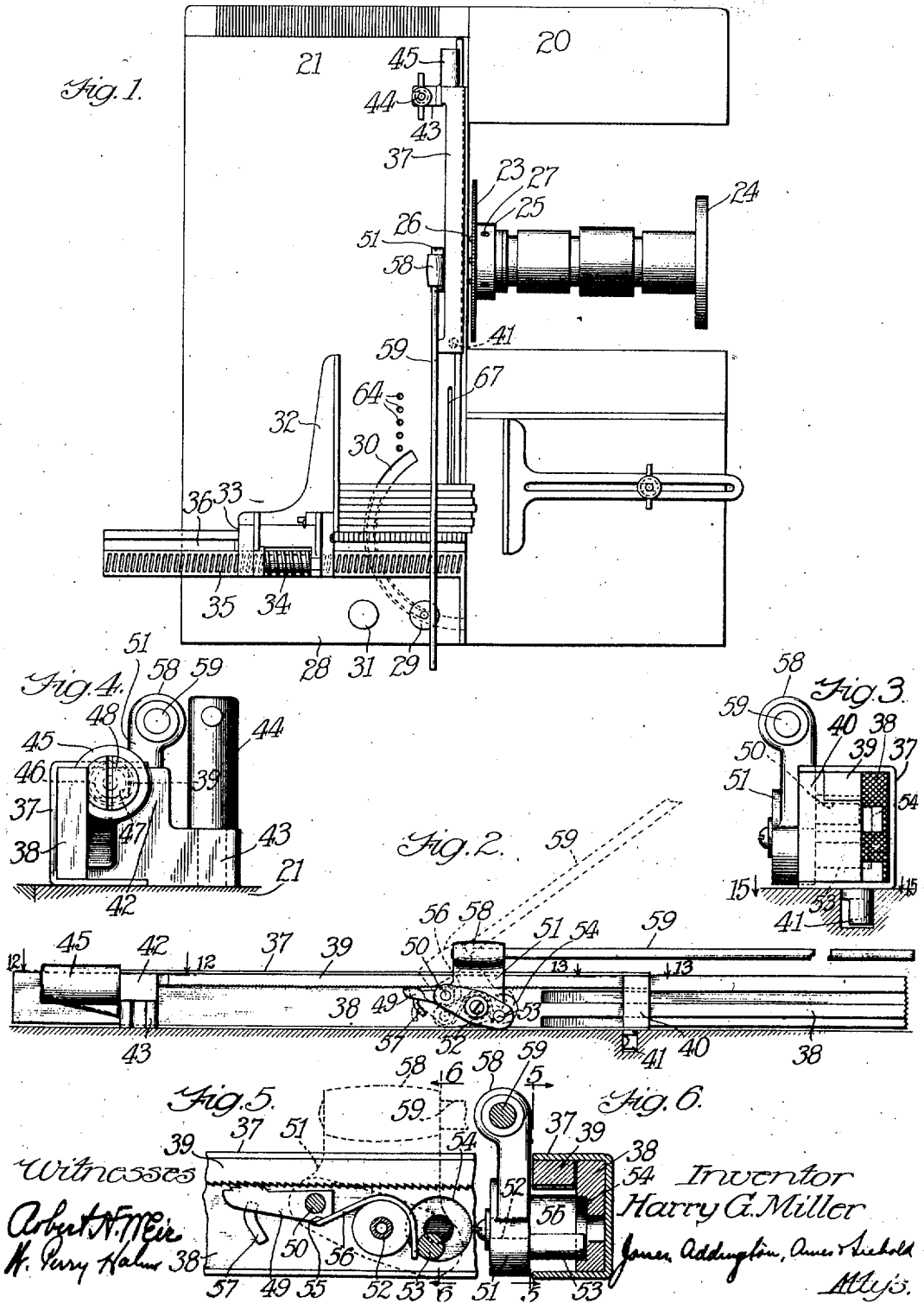


986,485.

H. G. MILLER.
 VISE.
 APPLICATION FILED APR. 18, 1910.

Patented Mar. 14, 1911.

3 SHEETS-SHEET 1.



H. G. MILLER.

WISE.

APPLICATION FILED APR. 18, 1910.

Patented Mar. 14, 1911.

986,485.

3 SHEETS—SHEET 2.

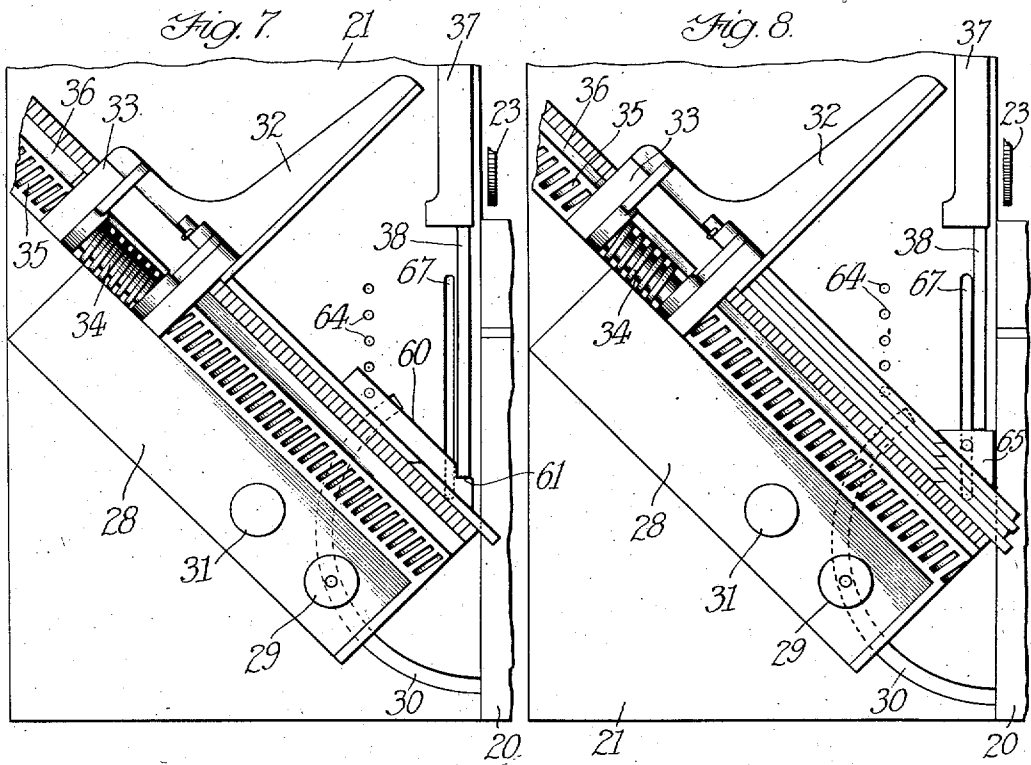


Fig. 9.

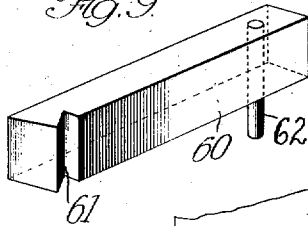


Fig. 10.

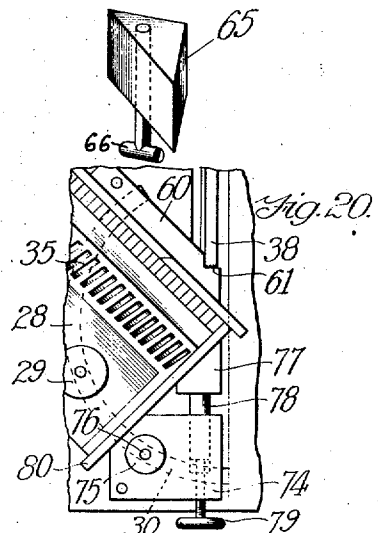
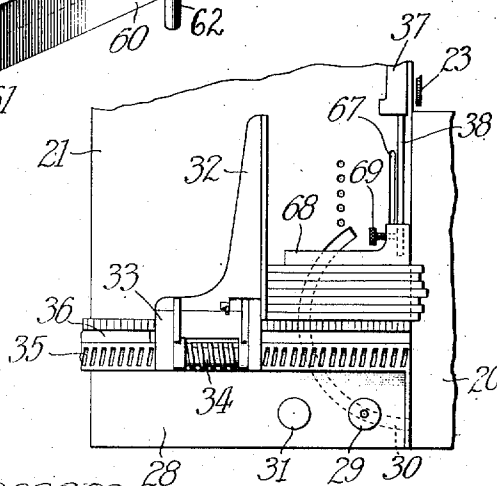


Fig. 11.



Witnesses

Robert H. Meier
H. Perry Hahn

Inventor

Harry C. Miller
James Addington, Amer. Subold
H. G. J.

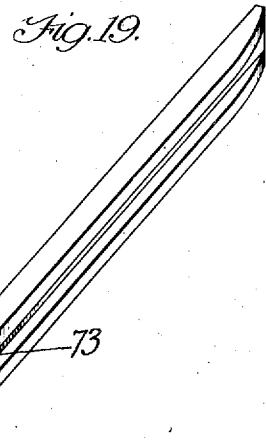
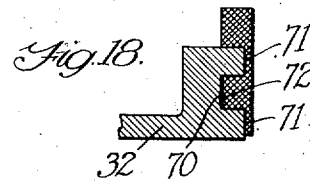
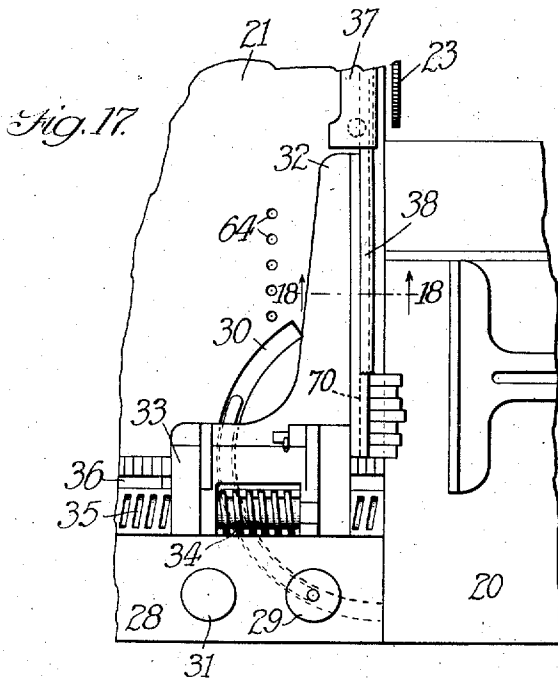
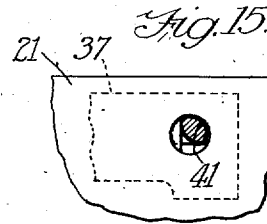
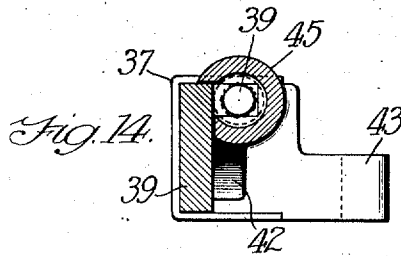
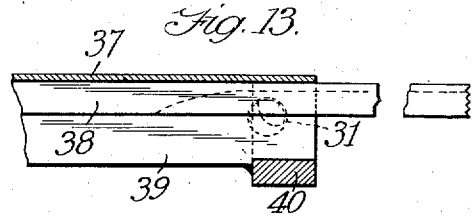
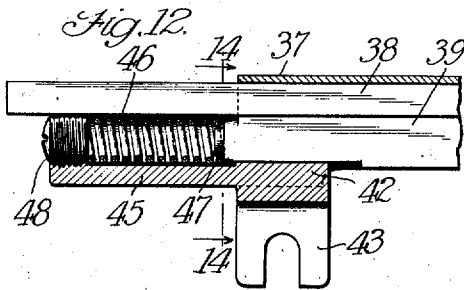
H. G. MILLER.
VISE.

APPLICATION FILED APR. 18, 1910.

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3 SHEETS—SHEET 3.

986,485.



Witnesses
Robert N. Weir
W. Perry Halpin

Inventor
Harry G. Miller
James Addington, Amos Schold
Attys.

UNITED STATES PATENT OFFICE.

HARRY G. MILLER, OF MILWAUKEE, WISCONSIN, ASSIGNOR TO MILLER SAW-TRIMMER COMPANY OF MICHIGAN, OF ALMA, MICHIGAN, A CORPORATION OF MICHIGAN.

VICE.

986,485.

Specification of Letters Patent.

Patented Mar. 14, 1911.

Application filed April 18, 1910. Serial No. 555,999.

To all whom it may concern:

Be it known that I, HARRY G. MILLER, a citizen of the United States, residing at Milwaukee, in the county of Milwaukee and State of Wisconsin, have invented new and useful Improvements in Vises, of which the following is a full, clear, concise, and exact description, reference being had to the accompanying drawing, forming a part of this specification.

My invention relates to improvements in vises and is particularly adapted for use in connection with machines for cutting linotype slugs and other material used in the printing art.

My invention is preferably used in connection with devices for cutting linotype slugs. Associated with such a device is a gage for positioning the work with respect to the cutting and trimming device and my vise is particularly adapted to cooperate with this gage to securely hold the work in position during the cutting operation.

The various objects and advantages of my invention will appear more fully hereinafter in the specification and claims.

For the purpose of illustrating my invention, I have shown one form thereof and one application thereof in the accompanying drawing.

In said drawing, Figure 1 is a plan view of a cutting device showing a table on which the work is located, a gage and the work-holding vise. Fig. 2 is a side elevation of my improved form of work-holding vise. Fig. 3 is a front end view thereof. Fig. 4 is a rear end view. Fig. 5 is a detail sectional view of the mechanism for connecting the vise bar of the vise to the ratchet bar, taken on the line 5—5 of Fig. 6. Fig. 6 is a sectional view taken on the line 6—6 of Fig. 5. Fig. 7 is a plan view of a portion of the table showing the gage moved in a position to cut a miter, and a holding block adapted to be used in connection with my vise. Fig. 8 is a view similar to Fig. 7, showing a different form of holding block. Fig. 9 is a perspective view of the holding block illustrated in plan in Fig. 7. Fig. 10 is a perspective view of the holding block illustrated in plan in Fig. 8. Fig. 11 is a plan view showing another form of holding block which may be used in connection with my vise. Fig. 12 is a sectional view taken on the line 2—2 of Fig. 4. Fig. 13 is a detail

sectional view taken on the line 13—13 of Fig. 2. Fig. 14 is a sectional view on the line 14—14 of Fig. 12. Fig. 15 is a sectional view on the line 15—15 of Fig. 3. Fig. 16 is a detail view showing the locking pin of the vise. Fig. 17 is a plan view showing how short pieces of work are held by my vise. Fig. 18 is a section taken on the line 18—18 of Fig. 17. Fig. 19 is a perspective view of a detachable face piece for the gage, and Fig. 20 is a plan view showing a secondary work-holding vise.

In the construction illustrated, I provide a table 20, having a sliding work supporting section 21. This table is mounted on a suitable standard on which is also mounted a rotating shaft 22, carrying at one end a rotary cutting tool 23 and at the other end a grinding wheel 24. The cutting tool 23 comprises a combined saw and trimmer, the saw being mounted on a head 25 and having an opening or openings therein, through which project trimmer knives 26 mounted in the head 25 and removably secured in position by screws or other securing means 27.

On the front part of the table is a gage mechanism by which the material to be cut and trimmed may be properly positioned relatively to the cutting tool. This gage comprises a gage plate 28, which has extending therethrough a follower pin 29 having an arc shaped extension rigid relative to the gage plate and adapted to extend into an arc-shaped groove 30 formed in the table, this groove being so arranged that when the gage plate is swung around, it will be moved in the arc of a circle having its center on the line of cut of the cutting tool 23. A locking pin 31, inserted through the gage plate, fits in openings on the sliding table to lock the gage plate in the position to which it may be moved. The movable member of the gage comprises an arm 32, having a straight edge which extends at an angle to the straight edge of the gage plate 28 and is provided with a bracket 33, carrying a screw member 34. This screw removably engages the teeth of a rack 35 formed on the upper face of the gage plate, and by rotating the screw the work is properly positioned with respect to the cutting tool. A suitable slot 36 is formed on the upper face of the gage plate and in this slot is adapted to fit a rib member extending downwardly from the bracket 33 whereby the arm 32 is slidably

supported on the gage plate 28. The threads of the rack 35 and the threads of the screw 34 are cut to have a pitch based on a point as a unit of measurement whereby the movable member 32 may be adjusted accurately relatively to the cutting tool by units of measurement used in the printing art. The trimmer knives 26 being adjustable, they may be set with reference to the gage arm thereby insuring accuracy under all conditions.

For holding the material to be cut in the gage, I provide a suitable vise, which is removably fastened on the sliding table and lies parallel with the cutting tool 23. This vise comprises a casing 37, a movable vise bar 38, a stop member or ratchet bar 39, and mechanism for connecting the movable member with the ratchet bar. The forward end of the casing has secured therein a guide 40, which is sufficiently spaced from the back of the casing to permit the vise member to move between said casing and the guide, and is recessed on its upper side to receive the forward end of the ratchet bar 39. On the under side of the casing at its forward end is provided a locking pin 41, which is adapted to fit in an opening formed in the table to hold the vise in position. The rear end of the casing is also provided with a guide block 42, suitably spaced from the back of the casing to permit the vise bar 38 to slide therebetween, and is recessed on its upper side to receive the rear end of the ratchet bar. Extending laterally from the guide block 42 is a bifurcated foot 43 arranged to be engaged by a clamping screw 44 to hold the rear end of the vise in position. Extending rearwardly from the guide block 42 is a spring housing 45, in which is arranged a coil spring 46, adapted to fit over the end of the ratchet bar 39. It will be noted that the end of the ratchet bar is provided with a reduced end portion 47, over which the coil spring is adapted to fit. By this arrangement, the spring is properly centered and any tendency on the part of the spring to bind against the sides of its housing is prevented. The rear end of the housing is closed by a screw 48, by which the tension of the spring may be adjusted. The vise bar 38 is connected to the ratchet bar 39 by a pawl 49 which is pivoted upon a pin 50, extending laterally from one end of a lever head 51. This lever head is pivotally mounted upon a stud 52, extending laterally from the vise bar 38 and is provided with an inwardly extending stop pin 53, adapted to operate in an opening 54 formed in the vise bar. The pawl 49 on its under side is beveled as at 55 and a flat spring 56 having one end engaging the pin 53 and passing over the stud 52, has its opposite end arranged to engage the rear of the pawl, flat spring 56 engaging the bevel face 55 of the pawl or

the straight rear edge of the pawl will maintain the pawl in the two positions in which it may be moved. On the under side of the pawl, near its outer end, is provided a downwardly extending pin 57 adapted to throw the pawl upwardly when the front end of the lever head is thrown up. In Fig. 2 in full lines the pawl is shown out of its locked position. Assuming that it is desired to release the material the outer end of the lever or handle 59 is raised. This lowers the pawl out of engagement with the rack and due to the engagement of the spring 56 with the beveled edge of the pawl, the pawl will move with the lever head. In raising the lever 59, however, it is not raised sufficiently to cause the pin 57 to engage the bottom of the casing. In order to cause the pawl to again engage the rack in position to place the spring 46 under tension, the lever is raised far enough to cause the pin 57 to engage the bottom of the casing. This moves the front end of the pawl upwardly, and after the beveled edge 55 has passed off the spring 56, the pawl will be snapped upwardly into an engaging position by the action of the spring. The upper end of the lever head is provided with a socket 58, in which is fastened a lever or handle 59.

Describing the operation of the apparatus thus far described, it will be assumed that it is desired to cut a number of linotype slugs down to a predetermined length, having the point as a unit of measurement. Under these conditions, the movable member 32 of the gage is advanced by turning the screw 34 until the proper length is reached, as indicated by indicating marks on the upper face of the rack 35 and by graduated marks on the bracket 33 and screw 34. The slugs are then placed in position in the gage as shown in Fig. 1 and the handle 59 is pulled forward by the operator. This moves the vise bar 38 forward until its front edge engages the slugs. The operator then moves the handle downward, which tilts the lever head, throwing the pawl 49 upward and into engagement with the rack on the ratchet bar 39. The pawl in connection with the lever head now forms a toggle having one end in engagement with the ratchet bar 39 and the other end connected on the stud 52. The throwing of the center of the toggle thus formed, upwardly advances the vise bar 38 hard against the slugs and the rest of the movement of the toggle is taken up by a rearward movement of the ratchet bar 39 against the spring 46. When the center of the toggle passes the line extending from the point of engagement of the pawl with the ratchet to the stud 52, the vise bar will be securely locked against rearward movement and will be held in resilient engagement with the material to be cut. The sliding table 21 may now be slid forward, car-

rying with it the slugs, which will be cut and trimmed by the cutting tool 23. When it is desired to move the work from the vise, the handle 59 is raised, thereby throwing the center of the toggle downward and disconnecting the pawl from the ratchet 39.

In Figs. 7 and 8, I have illustrated a means for cutting a miter on the end of the slug. This is particularly advantageous where the slug is adapted to be used for corners or the like and it is desired to get an accurate fit. In Fig. 7, I have shown the gage swung around until the straight edge of the member 32 extends substantially at an angle of 45° with respect to the line of cut. Under these conditions, the vise bar engaging the slug or slugs might tend to force the same slightly out of position, thereby spoiling the accuracy of the cut. I have, therefore provided a holding block 60, which may be inserted between the vise bar and the material to be cut. This block has its front end beveled so that it can be placed in close proximity to the cut and is provided with a notch 61, having one face thereof so arranged that it will present a flat surface to be engaged by the vise bar 38. The rear end of the block is provided with a downwardly extending pin 62 adapted to fit in suitably spaced openings 64 in the top of the table. These openings are so spaced that the block will be spaced a given distance from the edge of the plate 28, this distance being based on the point as a unit of measurement. It will be noted that when the work to be held in position is placed along the straight edge of the plate 28 of the gage and the block placed in the opening nearest the work to be cut, the vise member can now be moved forward and the block will be firmly forced against the work to be cut. This is particularly advantageous when two mitered sides are to be used and the cut is to be made with absolute accuracy.

In Figs. 8 and 10, I have illustrated a different form of holding block. This block may be used in the same connection as the block illustrated in Fig. 7, but is particularly adapted where the angle of the cut is greater or less than 45° . Under these circumstances, when it is desired to get a wide bearing surface against the work, a triangular block such as 65 may be used. This block is provided with a tongue 66, adapted to slide in a correspondingly shaped slot 67 formed in the top of the table. Blocks similar to 65, having different angles, may be provided so that a flat engagement may be secured, irrespective of the angle to which the gage is moved.

In Fig. 11, I have illustrated still another form of holding block, which may be attached directly to the end of the vise bar. In this instance, the block consists of a straight edge 68, having a slot therein to fit over the

end of the vise bar 38 and provided with a screw 69 for fastening the same in position. This block may be used when it is desired to get a wide bearing surface against the material to be cut and the material to be cut is adapted to lie at right angles to the line of cut.

In Figs. 17, 18 and 19, I have illustrated an arrangement whereby very short pieces of material may be cut, and the gage used for measuring these short pieces. It will be noted that the bearing face of the movable member of the gage cannot be moved up to the line of cut due to the position of the vise on the table. In order that the gage may be moved closer to the line of cut, the face of the straight edge may be formed with a recess 70 and the side of the vise bar formed with recesses 71 and a projection or rib 72, the recesses 71 receiving the ribs on the front face of the movable member 32 and the projection 72 being adapted to fit into the recess 70 formed on the front face of the movable member 32. By this arrangement, the gage may be moved very close to the line of cut as illustrated in Fig. 17.

In Fig. 19, I have illustrated a detachable front face for the movable member 32. It is frequently for certain purposes desired that the straight edge of the movable member 32 be made perfectly flat, therefore, in order that very short lengths of material may be cut and at the same time measured by the gage, I have provided this removable face 73, illustrated in Fig. 19. In practice, the space between the line of cut and the face of the movable member of the gage is two picas. In order that a slug less than two picas may be measured and cut, I provide this detachable face member 73, which has a sliding engagement with the vise bar 38 and is exactly two picas wide and recessed to the depth of one pica. By this arrangement, the movable member 32 with the removable face may combine to give an exact measurement down to one pica on the work to be cut. This removable face member may take most any shape but is preferably constructed as illustrated in the drawing.

In Fig. 20, I have illustrated a supplemental vise member. It will be noted, by reference to Fig. 7 or 8 that when a mitered or beveled cut is being made, there is quite a portion of the slug which extends beyond the inside end of the plate 28. It sometimes occurs, due to the fact that this end is not rigidly supported or backed up, that the cutting device will throw a slight bur on the material, thereby decreasing the absolute accuracy of the work turned out by the machine. In order to overcome this, I provide the supplemental vise member which is illustrated in Fig. 20. This vise member,

it will be noted, comprises a block 74 which is held in position on the sliding section 21 of the table by a bolt 75, extending into the groove 30 and by a small dowel pin 76, adapted to fit in a suitable opening or hole in the top of the table. The movable vise member 77 of the supplemental vise comprises a triangular block as shown having a rearwardly extending pin 78 adapted to fit in an opening formed in the block 74 and this movable member is actuated by a screw 79. In operation in order to back the material up, the slug is inserted in position just as is shown in Fig. 7, the second piece of work 80 is inserted in position as in Fig. 20, and the movable member of the vise is then screwed tight to hold the work in position. The sliding table 21 may now be moved forward and the cut made by the cutting tool. It will be noted that when the cut is made, not only is the slug cut, but the second piece of work 80 is also cut. The slug is thus supported or reinforced at the cutting edge and a fin or bur is prevented.

While I have shown and described certain constructions in the drawings and specification, it will be understood that various modifications and changes may be made therein without departing from the spirit of my invention, as set forth in the appended claims.

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

1. In a device of the character described, the combination with a stationary abutment member, of structurally independent holding means cooperating therewith to hold the work against the abutment member comprising a movable holding member, a resilient stop member, and means for connecting the holding and stop member together when the holding member engages the work to lock the holding member against movement toward the stop member.

2. In a device of the character described, the combination with a stationary abutment member, of structurally independent holding means cooperating therewith to hold the work against the abutment member comprising a movable holding member, a resilient stop member, and means operable irrespective of the position to which the movable member is moved to connect the holding and stop members together when the holding member engages the work to lock the holding member against movement toward the stop member.

3. In a device of the character described, the combination with a stationary abutment member, of structurally independent holding means cooperating therewith to hold the work against the abutment member comprising a movable holding member, a resiliently mounted ratchet, a pawl on said movable member, and means for throwing

said pawl into engagement with the said ratchet to lock the movable member against movement toward the ratchet.

4. In a device of the character described, the combination with a stationary abutment member, of holding means cooperating therewith to hold the work against the abutment member comprising a resiliently mounted ratchet, a movable holding member, a lever pivoted on said holding member, a pawl pivotally mounted on said lever, and means for throwing said lever to throw the pawl into engagement with the ratchet to lock the holding member against movement toward the stop member.

5. In a device of the character described, the combination with a resiliently mounted ratchet member, of a movable vise member, a lever pivoted on said vise member, a pawl pivoted on said lever, said pivot point being arranged, when the pawl is thrown into engagement with the ratchet, to be thrown past its center whereby the movable member is automatically locked into engagement with the ratchet member.

6. In a device of the character described, the combination with a relatively stationary member, of a movable vise member, a separable toggle connection between said stationary member and vise member.

7. In a device of the character described, the combination with a relatively stationary member resiliently mounted, of a movable member and a separable toggle connection between said stationary member and said movable member.

8. In a device of the character described, the combination with a stationary spring, a ratchet connected therewith, a movable vise member arranged to engage the work to be held, a pawl connected with said movable member and arranged to engage said ratchet to lock the movable member in work-holding position and means for placing said spring under tension when the pawl is moved to lock the movable member.

9. In a device of the character described, the combination with a stationary abutment member, of structurally independent means cooperating therewith to hold the work against the abutment member comprising a spring-pressed ratchet, a movable holding member, and means for connecting said holding member with the ratchet and placing the spring thereof under pressure after the holding member has engaged the work.

10. In a device of the character described, the combination with a stationary abutment member, of structurally independent means for holding the work against said abutment member comprising a spring-pressed ratchet, a movable holding member, and means for connecting the holding member with the ratchet and placing the spring under pressure after the member has engaged the

work, and for locking the holding member against movement in the direction of the ratchet.

11. In a device of the character described, the combination with a stationary abutment member, of holding means to hold the work against said abutment member comprising a spring-pressed ratchet, a movable holding member, a pawl for connecting said holding member and ratchet together, and means for operating the pawl to place the spring of the ratchet under pressure after the work has been engaged, and for locking the holding member against movement toward the ratchet.

12. In a device of the character described, the combination with a cutting tool, of a gage for positioning the work with respect to said tool, one member of said gage comprising an abutment member and a structurally independent movable resiliently pressed holding member cooperating with said abutment member to hold the material in cutting position.

13. In a device of the character described, the combination with a cutting tool, of a gage for positioning the work to be cut with respect to said tool and pivoted to move in the arc of a circle, having its center on the line of cut, a vise for locking the work to be cut in said gage and extending parallel with the line of cut, and a holding block arranged to cooperate with said gage and vise, said block having one face adapted to extend substantially parallel with the work to be cut and another face arranged to extend substantially at a right angle to the line of cut.

14. In a device of the character described, the combination with a cutting tool of a gage for positioning the work to be cut with respect to said tool, one member of said gage comprising an abutment member, structurally independent means cooperating with said abutment member to hold the work in position, comprising a movable holding member, a stop member, and means for connecting the holding member with the stop member.

15. In a device of the character described, the combination with a cutting tool, of a gage for positioning the work with respect to said tool, one member of said gage comprising an abutment member, structurally independent means cooperating with said abutment member to hold the work in position, comprising a movable holding member, a resiliently mounted stop member, and means for connecting the holding member with the stop member.

16. In a device of the character described, the combination with a cutting tool of a gage for positioning the work with respect to said tool, one member of said gage comprising an abutment member, structurally

independent means cooperating with said abutment member to hold the work in position, comprising a movable holding member, a relatively stationary rack, and a pawl movable with said holding member and arranged to engage said rack to lock the holding member against movement toward the rack.

17. In a device of the character described, the combination with a casing, of a longitudinally movable vise bar, arranged in said casing, a rack mounted in said casing, a spring adapted to engage one end of said rack carried on one end of the casing, said engaging end of the rack having a reduced portion arranged to enter the coil of the spring, and a pawl on said movable vise bar arranged to engage said rack.

18. In a device of the character described, the combination with a stationary casing, of a vise bar slidable therein, a ratchet mounted in said casing and resiliently connected therewith, a lever pivoted on said vise bar, and a pawl pivotally mounted on said lever and arranged to engage said ratchet.

19. In a device of the character described, the combination with a work supporting table, of a stationary casing detachably mounted thereon, a vise bar slidably mounted in said casing, a ratchet mounted in said casing and resiliently connected therewith, and a pawl for connecting said vise bar with said ratchet.

20. In a device of the character described, the combination with a casing, of a vise bar slidably mounted in said casing, a ratchet resiliently supported in said casing, a toggle having one end thereof connected with said movable vise bar and the other end thereof adapted to be connected with said ratchet, and means for throwing the center of the toggle past its dead center when connecting the same with the ratchet.

21. In a device of the character described, the combination with a casing, of a vise bar slidable therein, a ratchet resiliently mounted in said casing, a toggle having one end thereof connected with said vise bar and the other end thereof adapted to be connected with said ratchet, and a lever for throwing the center of said toggle past its dead center to lock said vise bar against rearward movement.

22. In a device of the character described, the combination with a cutting tool, of a gage for positioning the work with respect to said tool and consisting of a movable member and a relatively stationary member, the face of the movable member being recessed, and a vise for holding the work in said gage, one side of said vise being ribbed to coincide with the face of the movable member.

23. In a device of the character described,

the combination with a cutting tool, of a gage for positioning the work with respect to the cutting tool and consisting of a movable member and a relatively stationary member, the movable member having a recess formed therein, and a vise for holding the work in position in said gage, having a lateral extension arranged to fit in the recess formed in said gage.

24. In a device of the character described, the combination with a cutting tool, of a gage for positioning the work with respect to said tool and comprising a relatively stationary abutment member and a movable member, means cooperating with said abutment member for holding the work in position, and a detachable face plate for the movable member of the gage.

25. In a device of the character described, the combination with a cutting tool, of a gage for positioning the work with respect to said tool and consisting of a movable member and a relatively stationary member, a vise for holding the work in said gage, ribbed on one side thereof, and a detachable plate for the movable member of said gage having a recess therein to receive the rib of said vise.

26. In a device of the character described, the combination with a cutting tool, of a gage comprising a relatively stationary member and a movable member, said relatively stationary member being pivoted to be moved to an angle with the line of cut of the tool, a vise for holding the work in said gage, and supplemental means for holding a backing for that portion of the material to be cut which extends beyond the end of the relatively stationary member of the gage.

27. In a device of the character described, the combination with a cutting tool, of a gage comprising a relatively stationary member and a movable member, said relatively stationary member being pivoted to be moved to an angle with the line of cut, a vise for holding the material to be cut in position in said gage, supplemental means for holding a backing member for backing

that portion of the material to be cut which extends beyond the end of the relatively stationary member of the gage, and means for holding said backing member in position.

28. In a device of the character described, the combination with a cutting tool, of a gage comprising a relatively stationary member and a movable member, the relatively stationary member being pivoted to be moved to an angular position with respect to the line of cut of the tool, a vise for holding material to be cut against one face of said relatively stationary member, and a second vise for holding material against a second face of said relatively stationary member.

29. In a device of the character described, the combination with a cutting tool, of a gage for positioning the material to be cut with respect to said tool and comprising a relatively stationary member and a movable member, said relatively stationary member having two faces arranged at angles to one another and pivoted whereby the two faces may be moved to a position to present a dihedral angle with respect to the line of cut, and means for securing the work in position against each of said faces.

30. In a device of the character described, the combination with a cutting tool, of a gage for positioning the material to be cut with respect to said tool and comprising a relatively stationary member and a movable member, said relatively stationary member having two faces arranged at angles to one another and pivoted whereby the two faces may be moved to a position to present a dihedral angle with respect to the line of cut, and a pair of vises adapted to secure the work against each of said faces.

In witness whereof, I have hereunto subscribed my name in the presence of two witnesses.

HARRY G. MILLER.

Witnesses:

W. PERRY HAHN,
CHARLES G. COPE.