N. M. BAKER & H. H. STYLL.

LENS SLOTTING MACHINE.

APPLICATION FILED MAR. 22, 1915.

1,282,022.

Patented Oct. 22, 1918.

2 SHEETS—SHEET 1.

Fig. I.

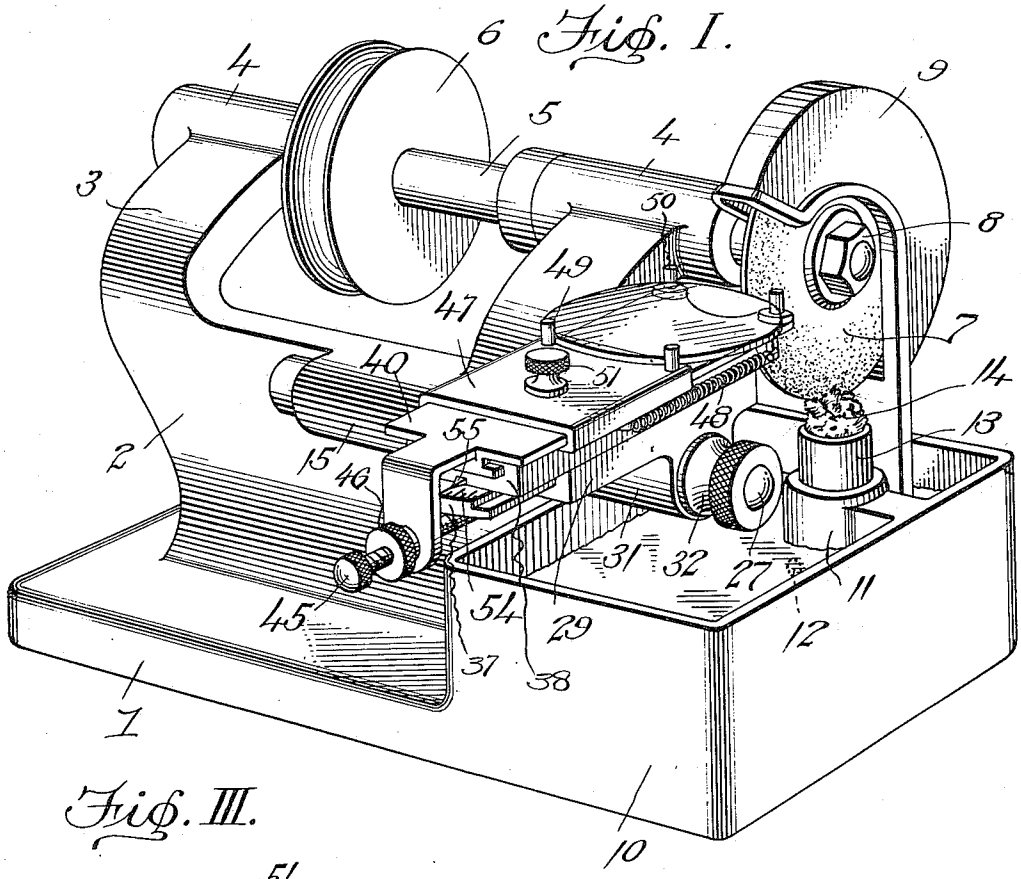


Fig. III.

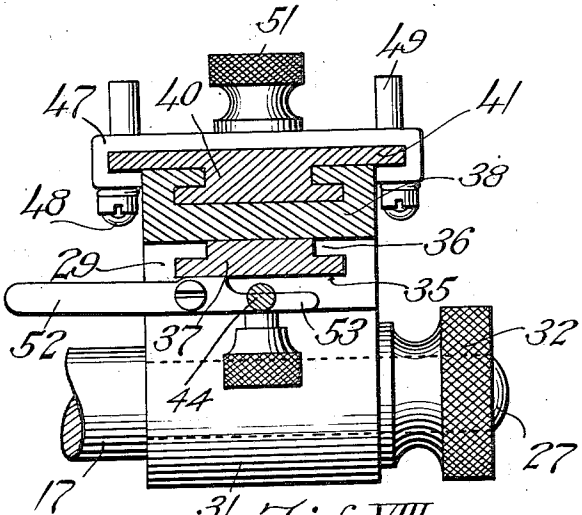


Fig. VIII.

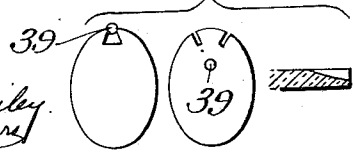
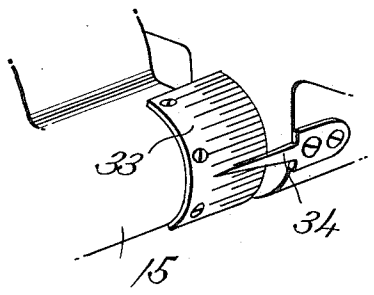


Fig. IV.



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2 SHEETS—SHEET 2.

Fig. II.

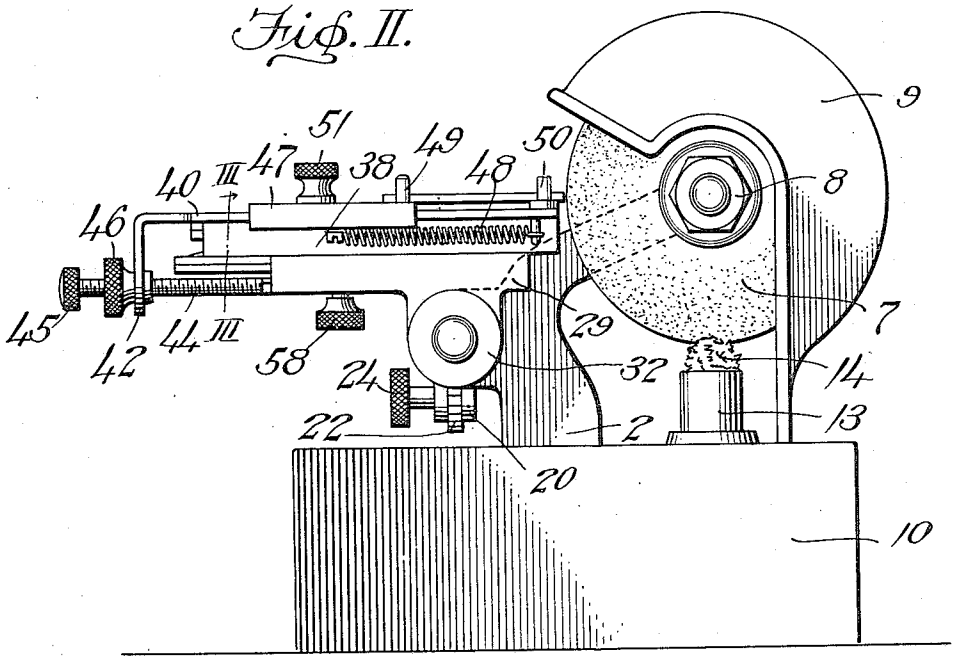


Fig. V.

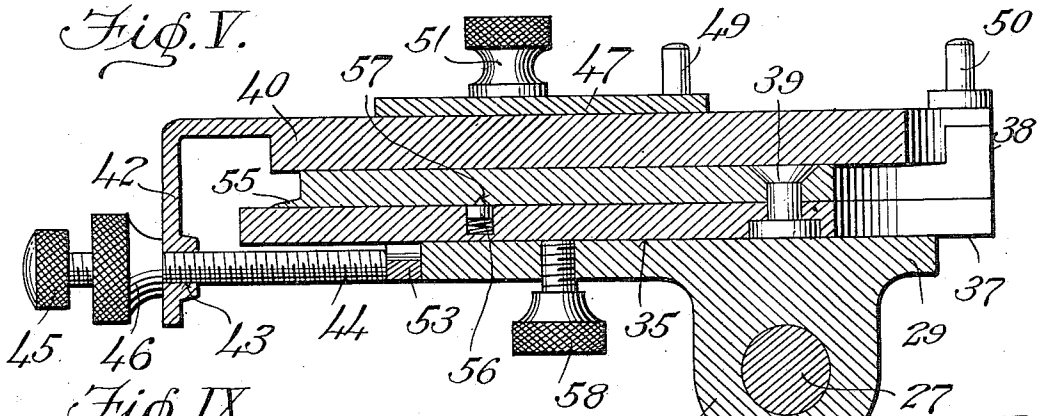


Fig. IX.

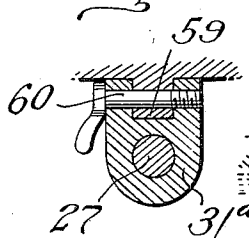


Fig. VI.

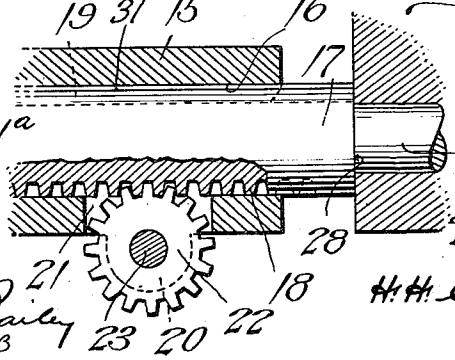
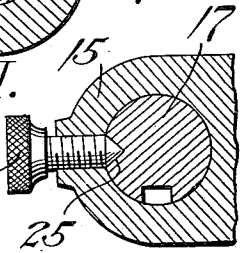


Fig. VII.



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UNITED STATES PATENT OFFICE.

NELSON M. BAKER AND HARRY H. STYLL, OF SOUTHBRIDGE, MASSACHUSETTS, ASSIGNORS TO AMERICAN OPTICAL COMPANY, OF SOUTHBRIDGE, MASSACHUSETTS, A VOLUNTARY ASSOCIATION OF MASSACHUSETTS.

LENS-SLOTTING MACHINE.

1,282,022. Specification of Letters Patent. Patented Oct. 22, 1918.

Application filed March 22, 1915. Serial No. 16,109.

To all whom it may concern:

Be it known that we, NELSON M. BAKER and HARRY H. STYLL, citizens of the United States, residing at Southbridge, in the county of Worcester and State of Massachusetts, have invented certain new and useful Improvements in Lens-Slotting Machines, of which the following is a specification.

This invention relates to lens slotting machines, and has for its primary object to provide means whereby universal movement of the lens holding table may be accomplished.

Another object resides in the provision of a universally movable table having means for locking the same in any adjusted position.

A further object is to provide gage means whereby the point of grinding of the lens may be determined from any position in which the table may be adjusted.

Other objects as well as the nature and advantages of the invention will appear by reference to the accompanying specification in connection with the accompanying drawings, in which:

Figure I is a perspective view of the complete machine.

Fig. II is an end elevation.

Fig. III is a transverse section on the line III—III of Fig. II.

Fig. IV is a detail perspective view illustrating the manner in which the degree of vertical swinging movement of the table may be determined.

Fig. V is a vertical central longitudinal sectional view through the work supporting table.

Fig. VI is a detail sectional view illustrating the manner in which the table may be moved longitudinally on the base of the machine.

Fig. VII illustrates one manner in which the table may be locked against longitudinal movement.

Fig. VIII illustrates plan and sectional views respectively of lenses showing the manner in which slots may be cut therein by means of the improved machine.

Fig. IX illustrates the manner in which vertical swinging movement of the table in two directions may be accomplished.

Referring to the drawings by numerals, wherein is illustrated the preferred embodiment of our invention, the numeral 1 designates a rectangularly shaped base plate having rising therefrom the bracket 2 which has the upper portion thereof cut away to provide the offset arms 3 terminating in bearings 4. A shaft 5 is journaled in the bearings 4 and has a pulley 6 mounted thereon and disposed between the arms 3, whereby rotation may be imparted thereto. A grinding or cutting wheel 7 of any preferred material or composition is mounted upon one end of the shaft 5 by means of nut 8, a shield 9 being disposed over the upper and rear portions of the wheel to prevent particles of water and dust from flying from the wheel when the same is rotated.

The end of the base adjacent the wheel 7 is provided with an enlarged hollowed out portion 10 which provides a tank for holding water to be supplied to the wheel 7. A bracket 11 is disposed directly beneath the wheel 7 and extends throughout the depth of the tank 10, an opening 12 being formed in one side thereof and in communication with the lower end of a tube 13 which is mounted in the bracket 11 so that the water may be free to pass within the bracket 11 and to the interior of the tube 13, a sponge 14 being placed within the tube 13 and disposed in contact with the wheel 7 in order to keep the same wet at all times.

While we have shown the bracket 11 as being directly beneath the wheel 7 and have described the material 14 as being a sponge, we do not wish to limit ourselves to this particular construction, as it will be obvious that other means for wetting the wheel 7 may be used.

A laterally extending offset boss 15 is formed on the bracket 2 and is provided with a cylindrical bore 16; a rod 17 having rack teeth 18 formed in the edge thereof is slidably mounted in the bore 16 and is keyed therein as at 19 in order to prevent rotation thereof. Depending bearing brackets 20 extend from the lower face of the boss 15 on either side of a slot 21 formed therein and have mounted therebetween a pinion 22, said pinion being mounted on a shaft 23 which extends through the brackets 20 and has at the outer end thereof the knurled head 24. It will be obvious that by turning the member 24 by the fingers, the pinion 22

will cause the rod to be moved longitudinally within the bore 16.

While we have shown one particular form of means for moving the rod 17 longitudinally, we do not wish to be limited to this particular structure as it will be obvious that other means may be employed.

If desired, means may be employed for preventing rotation of the rod 17 and also for positively locking the same in any longitudinally adjusted position. The rod 17 instead of being provided with the key and groove connection 19, will be provided with a V-shaped groove 25 which will be disposed in alinement with a threaded aperture in the front of the boss 15 so that when the finger actuated screw 26 is threaded in the opening the tapered end thereof will lie within the groove 25 and thereby prevent rotation of the rod 17. By loosening the screw 26 the rod may be readily moved longitudinally and it will be obvious that tightening of the screw 26 will positively lock the rod against longitudinal movement.

The outer end of the rod 17 is reduced at 27 to provide the shoulder 28, the outer end of the reduced portion 27 being threaded. The base portion 29 of a work supporting table is provided with a depending bracket portion 31 having a bore formed through it in which is mounted the reduced portion 27 of the rod 17, the inner face of the portion 31 abutting against the shoulder 28 and the outer face thereof being engaged by a thumb nut 32 which is threaded upon the outer threaded end of the reduced portion 27. It will be understood that when the nut is loosened the base portion 29 of the table may be readily rocked or tilted in a vertical plane upon the reduced portion 27 to any desired angle, and that tightening of the nut 32 will lock the said base portion in any adjusted position.

In Fig. IV, we have illustrated means whereby the angle to which the base plate is swung upon the reduced extension 27 may be positively determined. A curved plate 33 is secured in any preferred manner to the outer end of the boss 15 and projects past the outer face thereof any suitable distance. This plate is provided with any preferred number of graduations upon its outer face, and the portion 31 of the base plate 29 has a pointer 34 secured thereto in any suitable manner, the said pointer being adapted to extend over the plate 33 so that when the table is rocked or tilted upon the reduced portion 27 of the rod 17 the pointer will designate upon the plate 33 the exact angle at which the table is disposed, the pointer extending over the plate for a considerable distance in order to provide for the longitudinal movement of the table toward or away from the boss 15.

The base plate 29 is provided with a channel 35 in the upper face thereof and the said channel has projecting thereover, adjacent the longitudinal edges thereof, the inwardly extending lips 36. A slide 37 of a size and shape to be snugly received within the channel 35 is mounted for sliding movement within the said channel and has the upper face thereof terminating flush with the upper face of the lips 36. A horizontally rotatable guide plate 38 is pivotally mounted upon the slide 37 by means of a rivet or any other suitable fastening means which is most clearly illustrated in Fig. V of the drawings. This pivot 39 is provided with an enlarged head which fits a recess in the slide 37 and has the shank thereof extending through alined openings in the slide 37 and the plate 38 and has the upper portion thereof spread to engage the upper countersunk portion of the opening in the plate 38 so that the said plate 38 will be pivotally mounted upon the slide 37 for swinging movement in a horizontal plane, but will be fixed thereto against movement in any other direction.

The plate 38 is provided with a channel similar to the channel 35 in the base plate 29 in which is slidably mounted a lens supporting member 40, adapted to be manually shifted toward and away from the cutting or grinding wheel. Said lens supporting member is provided with a portion for engagement with the channel of the plate 38 and has the upper portion thereof provided with flanges 41 which extend over the side edges of the plate 38.

The outer end of the member 40 is reduced and extended longitudinally from the said member for a suitable distance and then bent downwardly at 42 and terminates at a point in a plane slightly below the lower face of the base plate 29. A threaded opening 43 is provided in the downwardly extending portion 42, adjacent the lower end thereof, and has threaded thereinto the shank 44 of an adjusting screw 45, a nut 46 being threaded on the shank 44 and adapted to be screwed into abutting relation with the outer face of the downwardly extending portion 42 to lock the shank in any adjusted position.

A lens clamping slide 47 has the longitudinal edges thereof extended downwardly and inwardly for engagement with the outwardly extending portions 41 of the member 40, whereby the said lens clamping member is slidably arranged on the uppermost portion of the table, springs 48 being secured to the inwardly extending portion of the clamp 47 and to the extensions 41 and being adapted to normally exert a tension to draw the said lens clamping member forwardly toward the inner end of the table. Vertically extending pins 49 are formed on the upper face of the clamping member

47, adjacent the inner end thereof, and are adapted to co-act with similar pins 50 formed upon the upper face of the member 40 at the inner end thereof to clamp a lens therebetween, as clearly illustrated in Fig. I, a finger actuating knob 51 being provided upon the upper face of the member 47 in order to provide means for manually releasing the lens from between the pins 49 and 50 against the action of the springs 48. It will thus be seen that member 40 and the parts carried thereby just described including the pins 49 and 50 and their supports, form a work clamp slidably mounted on the laterally and angularly adjustable table member.

The outer end of the base plate 29 has pivotally mounted thereon, adjacent one side thereof, a finger actuated lever 52 which has the inwardly extending portion 53 thereof cut away upon its upper face, as clearly illustrated in Fig. III of the drawings, so that the outer end thereof will only have to be raised slightly in order to lower the inner portion 53 to permit the shank 44 of the screw 45 to move into engagement with the outer end of the said base plate. The lever is of a width or thickness to correspond with the length of slot desired to be made in the lens, and it will be obvious that when the said lever is swung to a position to permit the shank 44 to engage the outer face of the base plate 29, the lens supporting member 40 will be permitted to move forwardly to bring the lens into engagement with the grinding wheel 7, different sized lenses being provided for through the adjustable mounting of the shank 44 within the downwardly extending portion 42 of the lens supporting member. It will thus be seen that the portion 53 of the lever 52 serves as a supplemental abutment or gage member which is adapted to be temporarily interposed between the abutment provided by the end of the screw 44 and the second abutment or stop formed by the outer end of the base plate and that this supplemental abutment or gage member therefore serves as a satisfactory aid to the operator in determining the final slot to be formed in the lens.

When it is desired to cut an angular slot in the lens, as illustrated in Fig. VIII of the drawings, the member 38 may be swung upon the pivot 39 to the desired angle at which the slot is to be cut which can be determined through the medium of a pointer 55 formed upon the outer face of the plate 38 and overlying the graduations 54 on the slide 37, a recess being formed in the upper face of the slide 37 and having a spring pressed plunger 56 slidably mounted therein and provided with a point for engagement with recesses 57 formed in the under side of the plate 38 and radially disposed with respect to the pivot 39 so as to hold the plate 38 against accidental movement, but which will permit of manual actuation when desired.

It will be noted that when it is desired to cut a slot such as illustrated in the first figure of Fig. VIII, the pivot point 39 will necessarily have to be moved to a point directly beneath the marginal edge of the lens to be slotted, and directly beneath the point at which the slot is to extend inwardly. In order to cut such a slot, the slide 37 is moved forwardly until the pivot 39 is moved to the point desired. The stud screw 58, which is threaded into an opening in the base plate 29 and engages the under face of the slide 37, is then tightened to lock the slide in its adjusted position. It will be obvious that in this position the lens may first be slotted radially by moving the table forwardly directly against the grinding wheel 7, after which the lens supporting member may be swung horizontally upon the pivot 38 to widen the inner part of the slot to the form desired.

It may be sometimes desired to form a groove such as is illustrated in the sectional view of Fig. VIII of the drawings. When such a groove as this is desired the nut 32 is released and the entire table tilted downwardly at its inner end so that the lens will be disposed tangentially with respect to the wheel 7. In this position the member 40 is moved forwardly to move the lens into engagement with the wheel, thereby grooving the lens.

From the foregoing description it is thought that the operation of the machine will be clearly understood, and that it will be clear how the various adjustments of the table may be accomplished. It will be noted that we have provided a table which is pivotally mounted for vertical swinging movement, which is adapted to be moved toward or away from the grinding or cutting wheel, and which is adapted to be swung laterally on a horizontal plane.

Occasion may arise when the table would be desired to be tilted sidewise. If desired, the portion 31[a] of the base plate may be formed as a separate piece, as illustrated in Fig. IX of the drawings, and may be bifurcated at its upper end to receive a depending lug 59 formed upon the lower face of the base plate 29, alined openings being formed in the lug and the sides of the bifurcated member to receive a pivot pin 60, one side of which is screw-threaded into one side of the member 31, and the other side of which is provided with an actuating handle whereby tightening of the pin will draw the bifurcated portion of the member 31 into engagement with the depending lug 59 to lock the table in any tilted adjusted position upon the member 31.

By reference to Fig. I of the drawings it

will be noted that the lens clamping means include the four pins 49 and 50 upon the slide 47 and the member 40 respectively. By having four of these pins the slide 47 may be moved rearwardly, a lens placed between the two sets of pins, and the slide released, the provision of the four pins serving to position the lens in correct axial alinement upon the table for slotting.

By reference to Fig. V of the drawings it will be noted that we cut away the central portions of the members 37, 38 and 30 at their inner ends in order to permit the said members to be moved forward toward the wheel when it is desired to advance the pivot 39 or swing the table upon its horizontal pivot, the cut away portions providing recesses in which the wheel 7 is adapted to operate when the table is in its forward position.

From the foregoing description, taken in connection with the accompanying drawings, it is thought that the construction and operation of the device will be clearly understood, and while we have herein shown and described one specific form of our invention, we do not wish to be limited thereto, except to such limitations as the claims may import.

We claim:

1. In a lens grooving or slotting machine, the combination with a frame, and a cutting wheel rotatably supported thereby, of a laterally shiftable guide rod carried by the frame, a base plate rotatably mounted on the guide rod, means for locking the plate in desired adjusted position around the guide, and a lens holding device mounted on the plate and movable thereover in a direction toward and away from the wheel.

2. In a device of the character described, the combination with a frame and a cutting or grinding wheel supported thereby, of a rod extending parallel with the axis of the wheel, a base plate pivotally mounted on the rod, means for locking the plate in desired pivotally adjusted position about the rod, a slide movable over the plate and bearing a pivot, a second plate supported by the pivot and a work clamping slide interlocking with and movable over the second plate to bring the work into engagement with the cutting wheel, substantially as and for the purpose described.

3. In a device of the character described, the combination with a frame and a cutting or grinding wheel supported thereby, of a work table carried by the frame, a work clamp disposed above the table, said clamp being mounted for movement toward and away from the wheel, and an adjustable pivot connection between the work clamp and the table, said connection including a pivot slidable over the table, means for locking the pivot in desired adjusted position, and a guide plate rotatably mounted on the pivot and interlocking with the work clamp to securely remain in engagement therewith irrespective of the adjustment of the pivot, substantially as described.

4. A machine of the character described, including a work clamp and a wheel for operating upon a lens within the clamp, and means for supporting the clamp in desired relation to the wheel, including a table mounted for movement parallel with the axis of the wheel and for rotation about an axis parallel to that of the wheel, a pivot carried by the table, means for locking the pivot in various adjusted positions as desired, and means connecting the work clamp with the pivot to permit of rotative adjustment of the holder about the pivot irrespective of the particular adjustment of the pivot relative to the table.

5. In a machine of the character described, the combination with a frame and a cutting or grinding wheel carried thereby, of a work clamp, a guide plate supporting the work clamp for movement toward and away from the wheel, and means on the work clamp engaging the guide plate for limiting the movement of the work clamp toward the wheel.

6. In a machine of the character described, the combination with a frame and a cutting or grinding wheel carried by the frame, of a guide plate, means for securing the guide plate in desired adjusted relation relative to the wheel, a work clamp movable over the guide plate for bringing the work into engagement with the wheel, coöperating abutments to limit the movement of the work holder toward the wheel, and a supplemental abutment or gage member movable in a position between the abutments to aid the operator in determining the final result to be attained.

7. In a lens slotting machine, a grinding wheel, and a work holding table disposed adjacent said wheel, said table comprising a base portion pivotally mounted for vertical swinging movement, a member slidably engaged on said base, a plate pivotally mounted on said slidable member, a lens holder slidably mounted on said plate, means to limit the sliding movement of said lens holder, and a clamping plate slidably arranged on said lens holder.

8. In a lens slotting machine, a universally movable work supporting table comprising a base portion, a member mounted on said base portion for sliding movement, a plate pivotally mounted on said slidable member, means to hold said plate in any horizontally adjusted position, a second member slidably mounted on said pivoted plate, said second member having a portion thereof bent downwardly at its outer end, screw means engaged with said downwardly

extending portion, and adapted to engage with said base plate to limit movement of said second member, a clamping plate slidably carried on said second member, means on said plate and said second member for gripping a lens, and spring means for holding said plate in engagement with said lens.

9. In a lens slotting machine, the combination with a base having a grinding wheel rotatably mounted thereon, of a work holding table including a base portion and a work holding member slidably mounted thereon, a depending screw supporting bracket formed on said work holding member, a screw engaged therewith, a lock nut for locking said screw in any adjusted position, and a lever pivoted to said base portion and normally lying in the path of movement of said screw, whereby swinging of said lever will move the same from the path of movement of the screw and permit increased movement of said work holder.

In testimony whereof we affix our signatures in presence of two witnesses.

NELSON M. BAKER.
HARRY H. STYLL.

Witnesses:
CARROLL BAILEY,
JOSEPH J. DEMERS.