

L. W. BUGBEE.
EDGING MACHINE.
APPLICATION FILED NOV. 5, 1915.

1,269,680.

Patented June 18, 1918.
6 SHEETS—SHEET 1.

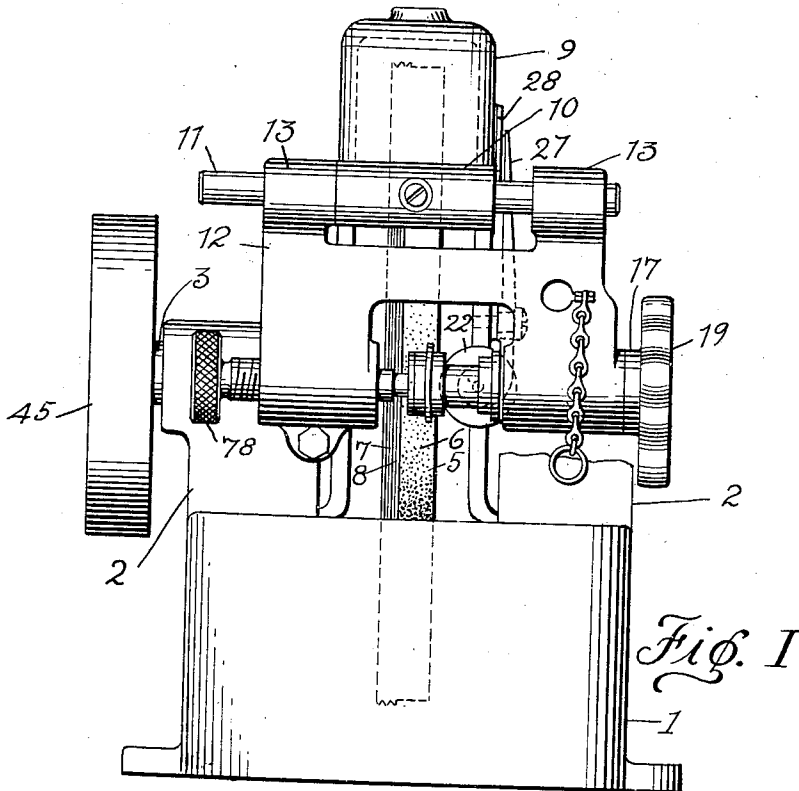


Fig. I

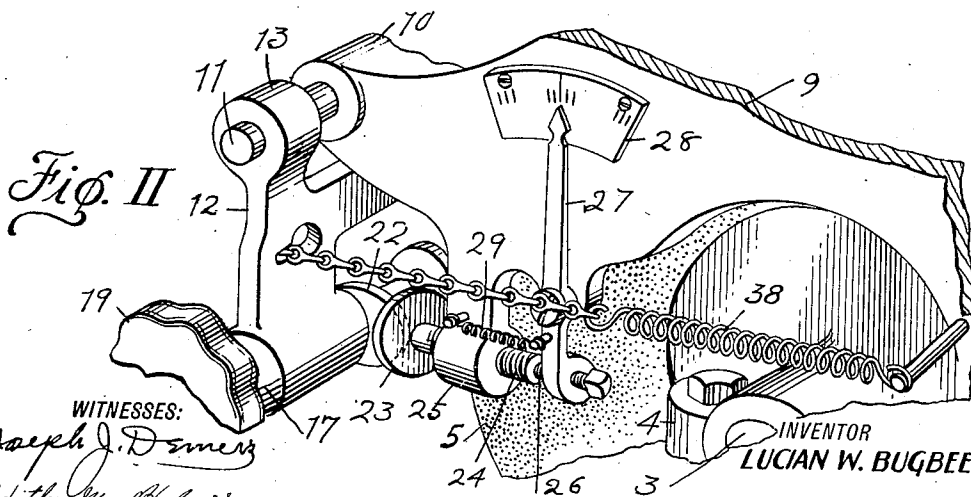


Fig. II

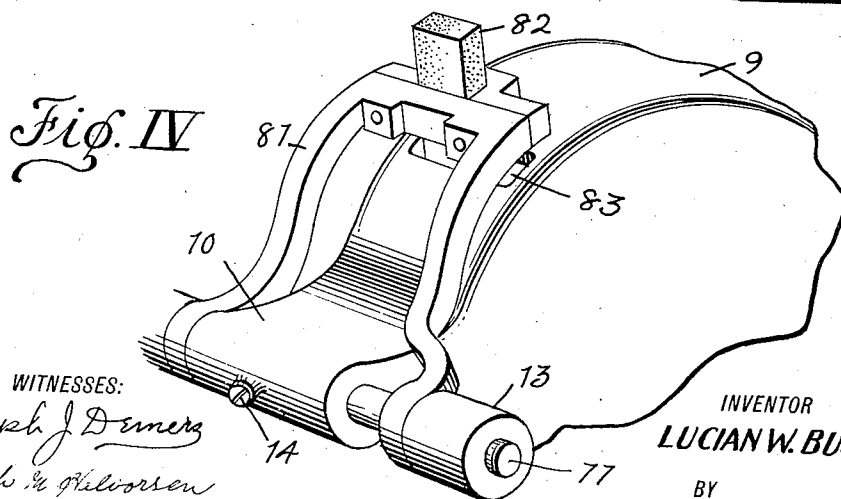
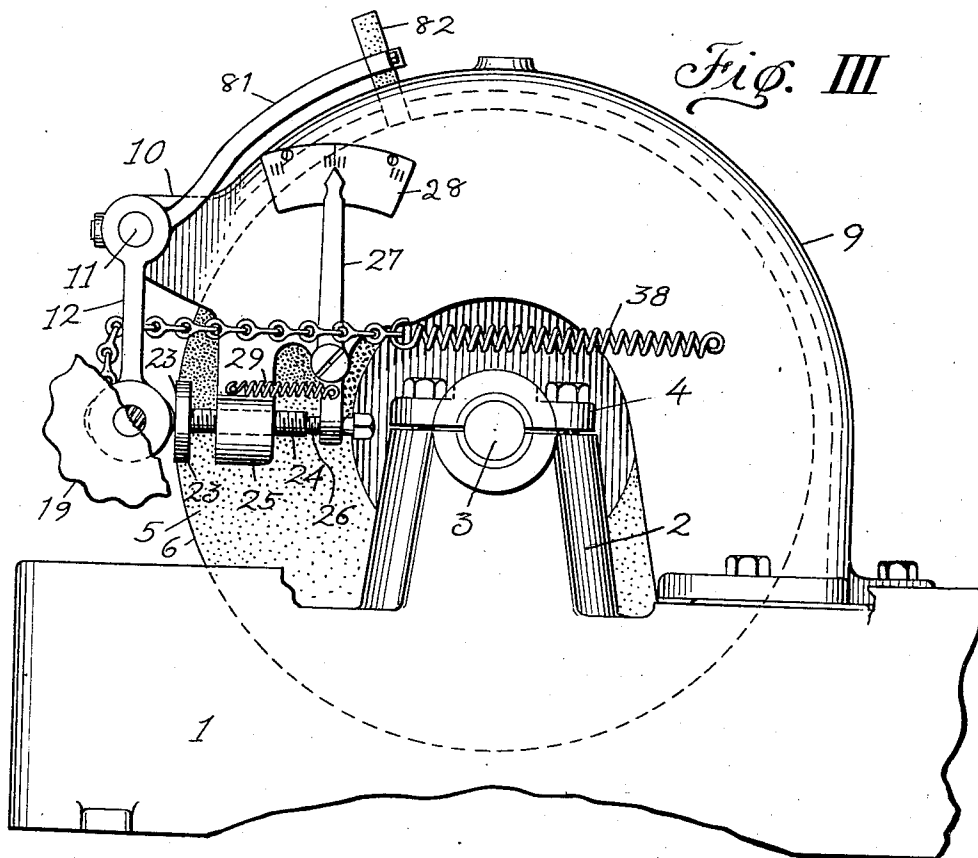
WITNESSES:
Joseph J. D. Smith
Edith M. Halvorson

INVENTOR
LUCIAN W. BUGBEE
BY
H. H. Styll *W. H. Parsons*
ATTORNEYS

1,269,680.

L. W. BUGBEE.
EDGING MACHINE.
APPLICATION FILED NOV. 5, 1915.

Patented June 18, 1918.
6 SHEETS—SHEET 2.



WITNESSES:

Joseph J. Demers
Edith M. Glaverson

INVENTOR

LUCIAN W. BUGBEE

BY

H. H. Styll & *A. K. Parsons*
ATTORNEYS

1,269,680.

Patented June 18, 1918.
6 SHEETS—SHEET 3.

Fig. V

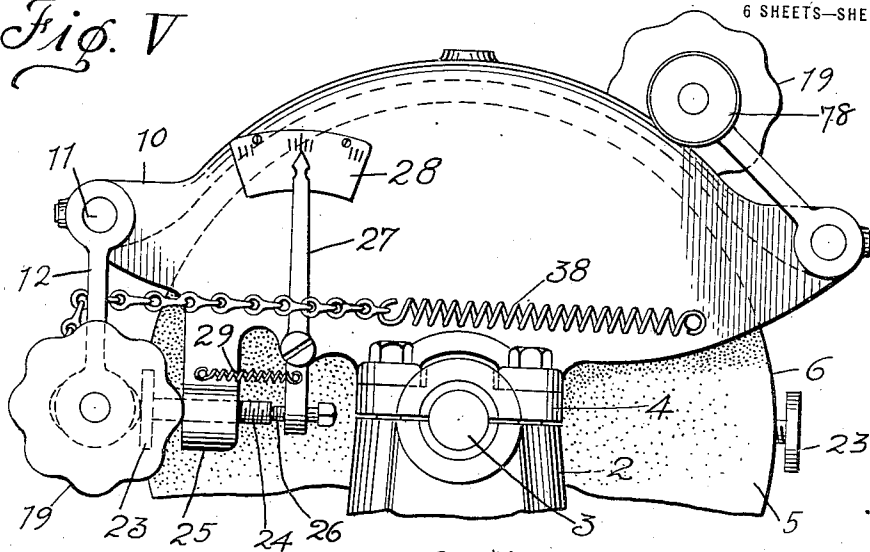
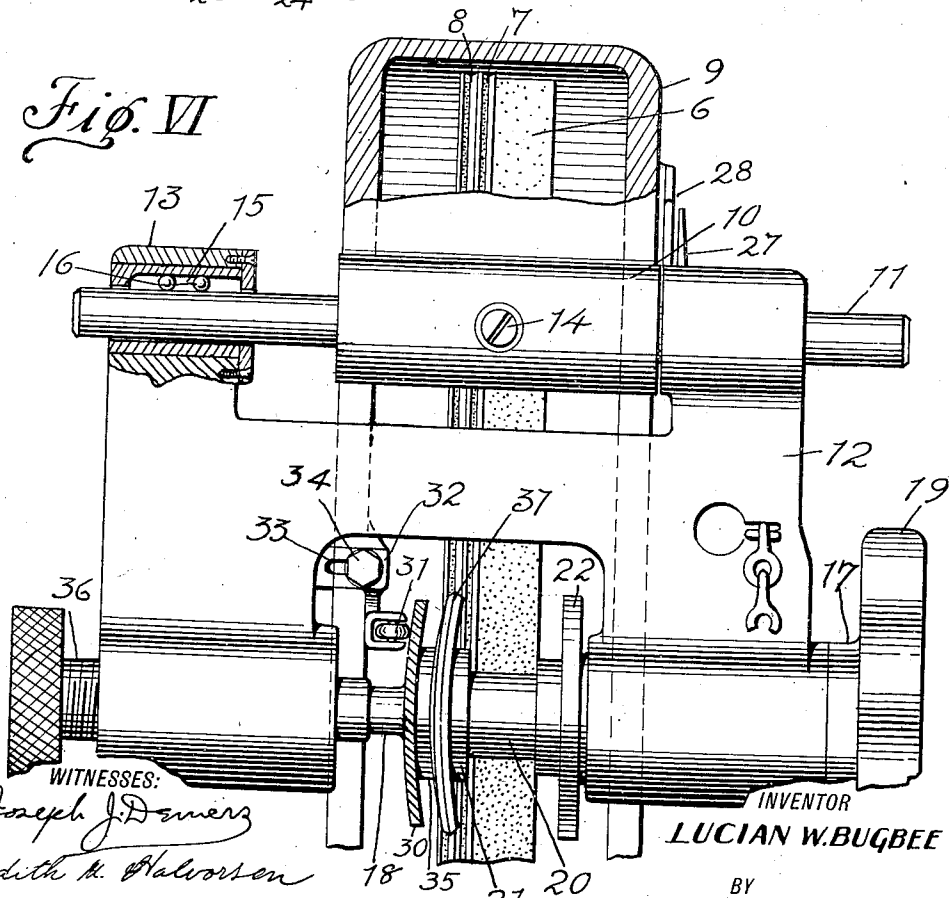


Fig. VI

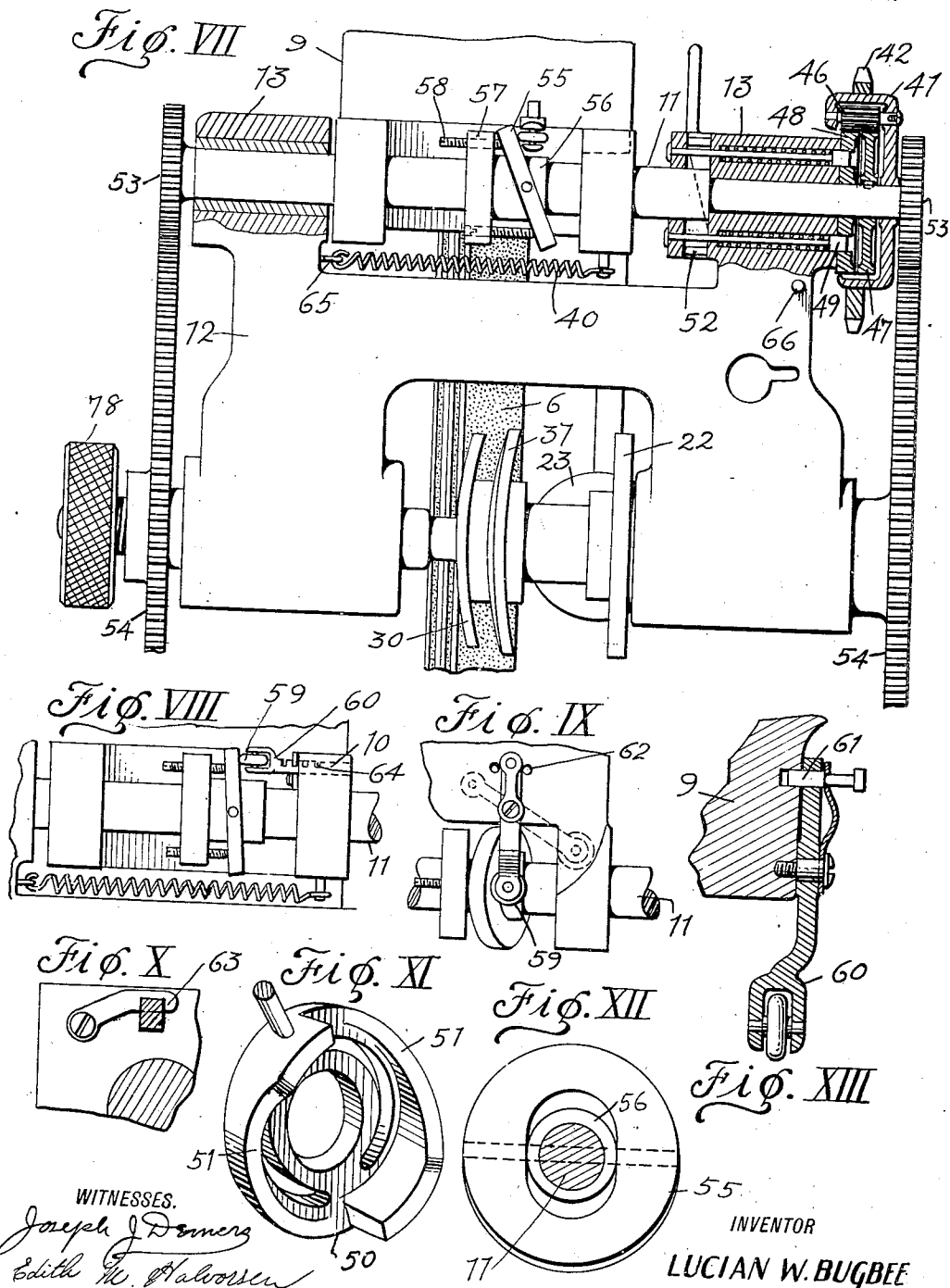


WITNESSES:
Joseph J. Demers
Edith M. Halvorsen

INVENTOR
LUCIAN W. BUGBEE
BY
H. H. Styll & *H. H. Parsons*
ATTORNEYS

1,269,680.

Patented June 18, 1918.
6 SHEETS—SHEET 4.



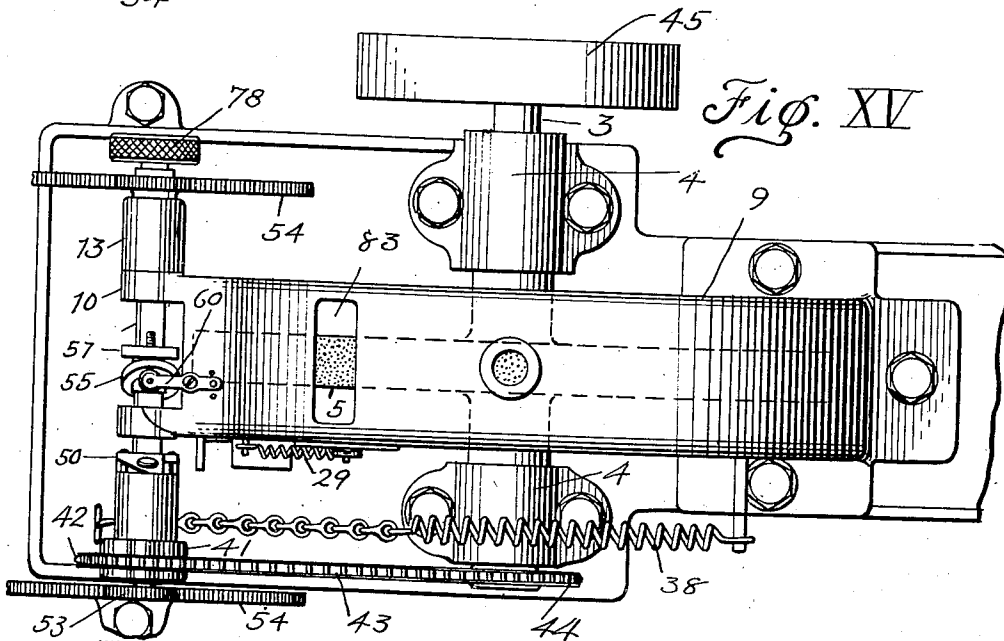
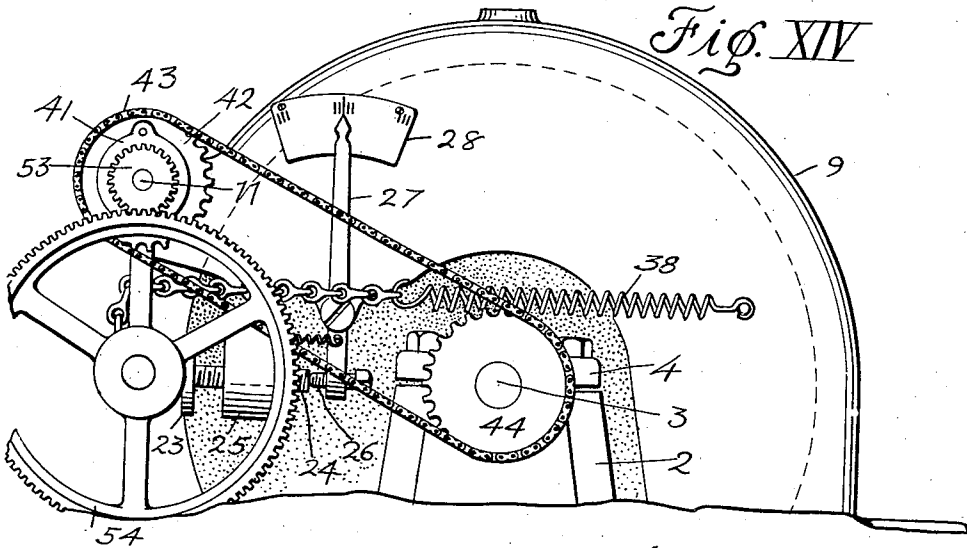
WITNESSES.
Joseph J. Demers
Edith M. Halvorsen

INVENTOR
LUCIAN W. BUGBEE
BY
H. H. Styll & *W. Parsons*
ATTORNEYS

L. W. BUGBEE.
EDGING MACHINE.
APPLICATION FILED NOV. 5, 1915.

1,269,680.

Patented June 18, 1918.
6 SHEETS—SHEET 5.



WITNESSES:

Joseph J. Demery
Edith M. Halvorsen

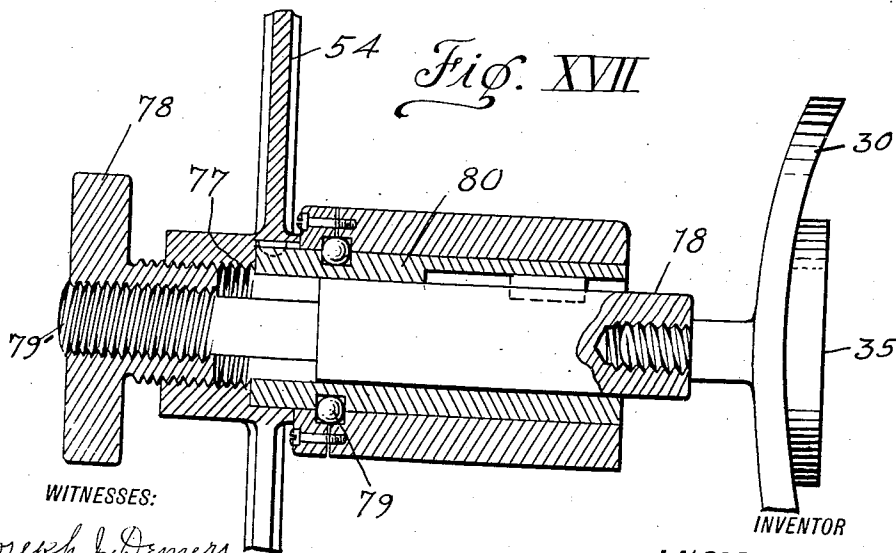
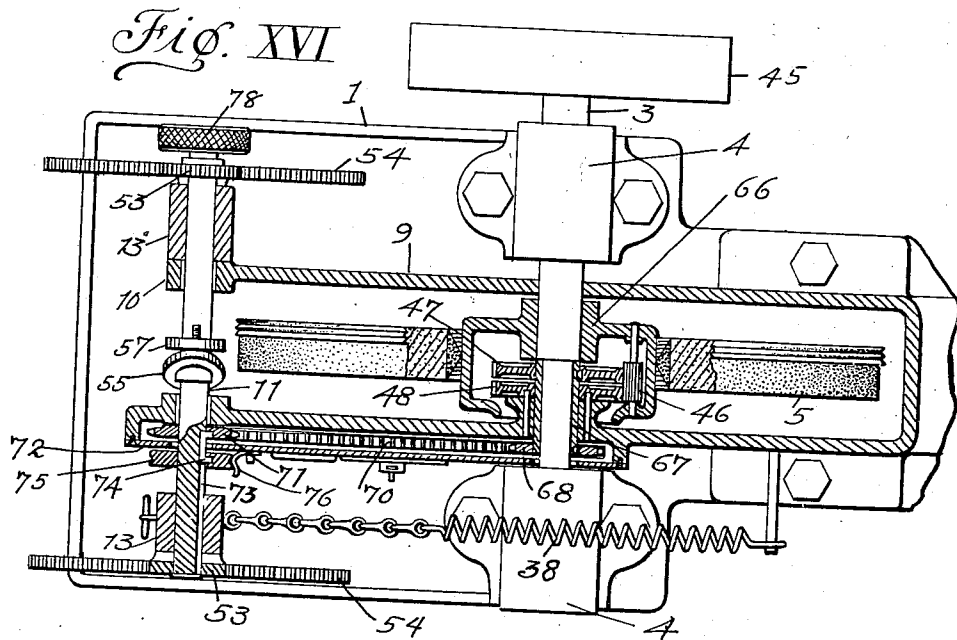
INVENTOR
LUCIAN W. BUGBEE

BY
H. H. Styll ~~et al~~ Parsons
ATTORNEYS

L. W. BUGBEE,
EDGING MACHINE.
APPLICATION FILED NOV. 5, 1915.

1,269,680.

Patented June 18, 1918.
6 SHEETS—SHEET 6.



WITNESSES:

Joseph J. Demers
Edith M. Helverson

INVENTOR

LUCIAN W. BUGBEE

BY

H. H. Styll & H. Parsons
ATTORNEYS

UNITED STATES PATENT OFFICE.

LUCIAN W. BUGBEE, OF SOUTHBRIDGE, MASSACHUSETTS, ASSIGNOR TO AMERICAN OPTICAL COMPANY, OF SOUTHBRIDGE, MASSACHUSETTS, A VOLUNTARY ASSOCIATION OF MASSACHUSETTS.

EDGING-MACHINE.

1,269,680.

Specification of Letters Patent. Patented June 18, 1918.

Application filed November 5, 1915. Serial No. 59,758.

To all whom it may concern:

Be it known that I, LUCIAN W. BUGBEE, a citizen of the United States, residing at Southbridge, in the county of Worcester and State of Massachusetts, have invented certain new and useful Improvements in Edging-Machines, of which the following is a specification.

This invention relates to improvements in edging machines, and has for its leading object the provision of a novel, simple and efficient machine for use in the edging of ophthalmic lenses.

One of the further objects of my invention is the provision of an improved type of machine which may be employed for edging either flat edge or bevel edge lenses.

Other objects of my invention include the provision of novel means for grinding the lens during the operation of bevel edging, the provision of novel size indicating means, of adjustable means for varying the amount of movement and the lateral limits of a particular zone of movement of the lens holding carriage, the provision of novel means for supporting said carriage, and for driving the same, and in general a simplification and improvement in the various parts of a machine of this character, and it will be understood that I may make any modifications in the specific details of construction shown and described within the scope of the appended claims without in anywise departing from or exceeding the spirit of my invention.

Figure I is a front view of a simple form of my edger.

Fig. II is an enlarged fragmentary perspective view of one side thereof.

Fig. III is a side elevation of the construction illustrated in Fig. I.

Fig. IV is a detail view particularly illustrating the mounting for the hone.

Fig. V is a side view of a double machine.

Fig. VI is a front view of the machine, particularly illustrating the manner of bevel edging a lens.

Fig. VII is an enlarged front view illustrating the mechanism for obtaining a variable throw and one form of my reducing mechanism and controlling clutch.

Fig. VIII is a front view showing a different adjustment of the cam member.

Fig. IX is a fragmentary plan view illustrating the cam and adjustable contact therefor.

Fig. X is a fragmentary view of the lock for the contact member shown in Fig. VIII.

Fig. XI is a perspective view of the clutch cam shown in Fig. VII.

Fig. XII is a sectional view of the rotating shaft with the face of the shifting cam shown in elevation.

Fig. XIII is a sectional view through the contact member shown in Fig. IX.

Fig. XIV is a side elevation of the machine as illustrated in Fig. VII.

Fig. XV is a top plan view thereof.

Fig. XVI is a sectional view taken diagonally of the edger, and

Fig. XVII is an enlarged fragmentary sectional view illustrating the lens clamping mechanism.

In the drawings, in which similar characters of reference are employed to denote corresponding parts throughout the several views, the numeral 1 designates the base or tub of my edger having rising therefrom the standards 2 forming the lower bearings for the grind-stone shaft 3, suitable bearing caps 4 or the like serving to retain the spindle in position. Mounted on the spindle or shaft 3 is the grind-stone 5, having the usual plain grinding surface 6 and in addition in the forms here illustrated being provided with the pair of beveled grooves 7 and 8, respectively, these grooves, as is clearly illustrated in Fig. VI, for example, being so disposed that the innermost point of the groove is substantially in line with the plain portion 6 of the stone, while the walls of the groove project outwardly beyond said portion 6. It will be noted that the construction of my improved machine has a particular advantage in that in the edging of a lens, the lens is first edged down to the correct size and shape on the plain portion of the stone and is then moved over until the edge of the lens engages within the groove 7 which will tend to round off the corners left by the edging and the portion 6 and produce a beveled effect. The grinding or edging of the lens in the groove 7 does not completely finish the same and it is therefore necessary to move the lens again so that the edge thereof is engaged within

the groove 8 which will put a finishing touch on the edge of the lens or smooth the roughened surface down caused by the grinding within the groove 7, it being understood that the grinding surface within the groove 8 is considerably finer than that of the groove 7.

By this construction but slight work is required from the grooves 7 and 8, and this work required only on the previously smooth portions of the lens, and as a result the grooves will last indefinitely without getting out of shape, as has hitherto been the difficulty experienced when attempts have been made to bevel edge lenses in a groove direct from the cut blank.

A further advantage of this particular construction resides in the fact that the lens may be edged down to correct size on the flat portion, and the carriage or lens holder then moved across to the grooves with the sizer plate and stop still in contact and the size thus maintained during the beveling operation and without the necessity of removing the lenses from the machine and readjusting them in a separate machine, etc.

Inclosing the stone to a greater or less degree, as may be desired, is a hood 9 which may be supported either on the tub or base 1, as indicated in Fig. III, or may be a part of or secured by the same bolts as the bearing caps 4, as illustrated in Fig. V for example. It will be noted from the foregoing taken in connection with the accompanying drawings, that the hood 9 is preferably curved over the upper portion of the stone and is provided with an offset projecting lip 10 in which is journaled the spindle 11. The lens-holding carriage 12 which is disposed adjacent the lip 10 is provided with suitable bearings 13 adapted to be mounted on the ends of the spindle 11 and either be rigidly or loosely connected therewith so that the spindle may be either moved through the bearings 13 or through the lip 10 and carry the bearings with the same in order to impart a lateral movement to the carriage.

In the simpler form of my edger, as illustrated in Fig. VI, for example, I have illustrated the spindle 11 as rigidly held in the lip 10 as by the set screw 14, and have mounted in the groove 15 in the members 13 the loose ball or roller bearings 16 riding on the ends of the spindle to eliminate as far as possible friction in the sliding of the carriage and render its action more sensitive.

I have also illustrated in this figure one embodiment of my improved guiding mechanism for the bevel edging of the lens.

Rotatably mounted in the lower portion of the carriage 12 are the two lens clamping spindles 17 and 18, the spindle 17 being provided on its outer end with the hand wheel 19 for rotating the same, and having at its

inner end the nut 20 bearing on one end the pad 21 and having its other end bearing against the former 22 to secure the former in position on the shaft 17. This former is adapted to contact with the head 23 on the adjustable screw 24 having threaded engagement with the lug 25 on the hood and having its inner end bearing against the compensating screw 26 on the lower end of the pointer 27 carried by the casing, whereby adjusting movement of the screw 24 shifts the pointer over the scale 28 to indicate the size of lens being formed, a spring 29 holding the screw 26 against the screw 24, and adjustment of the screw 26 serving to compensate for wear in any of the parts of the apparatus. It will thus be seen that the screw 24 may be readily set for the desired size of lens, while by loosening of the nut 20 the former 22 may be removed and changed according to the shape of finished lens desired. At the other side of the machine the spindle 18 has detachably mounted thereon the bevel edging former 30 having its face contacting with the roller 31 of the arm 32 which is suitably mounted for lateral adjustment, as by the provision of the slot 33 and locking bolt 34, it being understood that any desired means may be employed for obtaining the lateral adjustment of the arm 32 and contact roller 31 carried thereby. Projecting inwardly beyond the bevel former 30 is the pad 35 for engaging the lens, a screw-threaded or other clamping device 36 forcing the spindle 18 inwardly to clamp the lens between the pads 21 and 35, as is illustrated.

It is customary in the formation of ophthalmic lenses to grind the same with certain standard, or what is termed base curves, on one side or the other, and I accordingly provide formers 30 shaped to these various base curves, both convex, as illustrated, and concave, according to the several standard base curves.

In bevel edging a lens with the type of machine illustrated in Fig. VI for example, the parts being clamped together to retain the formers 22 and 30 and the lens 37 in position, the carriage is moved to the right, the stone suitably actuated and the lens held against the stone by the spring 38 and turned thereagainst through the medium of the hand wheel 19 until a flat edge of the desired size and shape as governed by the former 22 and position of the contact 23 has been produced. The arm 32 is then adjusted toward the right and the carriage moved sufficiently to the left to bring the former 30 into engagement with the roller 31, when the lens is again brought against the stone and will be found to fit within the groove 7. As the lens is then slowly turned through the medium of the hand wheel 19 with a

slight pressure toward the left to hold the former 30 and wheel 31 in contact, these parts will impart to the lens the necessary movement toward the right to compensate for the variations in position of the center of the edge of the lens as regards the center of the groove 7 on account of the curved form and oval outline of the lens, so that the bevel edge will be a constant distance from the base curve side of the lens at all points on its periphery. The bevel having been thus formed if it is found that this is not quite smooth enough or unsatisfactory in any way, the arm 32 is then shifted to the left and the carriage swung outward, the former again moved into engagement with the roller 31, when the beveled edge of the lens will be found to just fit into the groove 8, where it may be finished off as desired.

While I have described this particular operation as being manually performed, it will be understood that in the case of an automatic machine, such as shown in Fig. VII for example, the cam contact 59 may be moved into inoperative position as indicated by the dotted lines in Fig. IX, when the carriage actuating spring 40 will serve to hold the former 30 against its contact 31, and in this instance both the cross feed occasioned by the former 30 and the rotation of the lens through the gear and pinion connection illustrated will be entirely automatic so that the only manual work to be performed will be the shifting of the contact 59 into inoperative position and the swinging out of the carriage to allow the lens to clear the projecting portion of the bevel edging part of the stone and fit into the suitable groove in the stone.

While I have illustrated the operation of the bevel edge forming construction in connection with a former and lens having their convex sides toward the contact 31, it will be understood that this is merely because the base curve in the particular instance illustrated was on the convex side of the lens. With the base curve on the opposite side of the lens the lens would simply be reversed or placed with its concave side to the left and a concave in place of a convex former 30 be substituted to engage the member 31, the operation being otherwise identical.

While in Figs. I to VI inclusive I have illustrated a form of edger in which the carriage is adapted to be manually shifted relative to the stone, in Figs. VII to XVI I have illustrated a form of construction in which the lens is positively driven, and in which means are provided for positively shifting the carriage relative to the stone.

In the form illustrated in Fig. VII, the shaft 11 has freely rotating on one end the casing 41 bearing the sprocket 42 connected as by the chain 43 with the driving sprocket 44 secured on the grind-stone shaft 3, this shaft

being suitably driven as by a belt around the pulley 45 of the shaft. Carried by the casing 41 is the loose pinion 46 meshing with the gear 47 secured on the shaft 11 and also with the gear 48 fixed as by the sliding pins 49 to the portion 13 of the carriage. These pins are normally spring pressed into locking position, but have their inner ends engaged by the releasing member or clutch controlling device 50, having the cam surfaces 51 riding on the pins 52 fixed in the face of the member 13, whereby rotation of the member 50 will cause these surfaces to ride up on the pins 52 and thus draw the gear locking pins 49 out of engagement with the gear 48 and permit this gear to move freely around on the spindle 11.

It is the purpose of the gear arrangement just described to attain the desired reduction in speed between the speed of rotation of the grind-stone shaft 3 and the shaft 11, this being accomplished by making a slight difference as of one tooth, between the gears 47 and 48, so that each rotation of the sprocket 42 and casing 41 will on account of the intermeshing of the pinion 46 with both of the gears, cause a relative movement of the gears of but one tooth, this amount of movement being imparted through the gear 47 to the spindle 11. In the event, however, that the gear 48 is disengaged from the portion 13 of the carriage, as by the clutch mechanism just described, the friction of the parts of the carriage will be sufficient to prevent rotation of the spindle and the gear 48 will be given this slow rotation in place of the gear 47, so that by movement of the clutch the stone, chain and sprocket may continue to be driven without in any wise affecting the carriage.

To drive the lens I connect the spindle 11 to the lens clamping spindle in the usual manner, as by the pinions 53 on the spindle 11 meshing with the gears 54 on the two lens clamp spindles.

At the same time to cause a movement of the carriage and thus the lens transversely of the face of the stone, I secure as on the spindle 11, a suitable shifting mechanism. In the present instance I have indicated this as a disk 55, pivotally secured to the collar 56, this collar being either independently keyed or secured to the spindle, or the pivot extending through both the spindle and collar, as indicated in Fig. XII. In any event, the collar 56 is provided with the flange 57 bearing the screws or adjusting devices 58 having their inner ends resting against the member 55, whereby adjustment of these members serves to vary the angular position of the member 55, as will be best understood by comparison of Figs. VII and VIII. It will thus be seen that I have in effect provided an adjustable cam surface which may be adjusted to extreme position

as shown in Fig. VII, to impart a considerable amount of movement to the carriage 12, or I may set the same almost straight, as shown in Fig. VIII, when but a slight movement will be imparted to the carriage. To engage the adjustable cam member 55 I preferably employ a contact roller 59 adjustably mounted on an arm 60, which may be either pivoted to the hood 9, as illustrated in Figs. IX and XIII, or may slide in one of the bearings 10 on the hood, as indicated in Fig. VIII.

In the case of the pivoted arm it may be secured in desired adjusted position as by the pin 61 adapted to fit in any one of a plurality of sockets 62 formed in the hood, while in the case of the sliding arm it may be secured as by the keeper 63 adapted to be engaged in any of the notches 64 in the arm. The purpose of the adjustment of the arm is that of controlling the portion of the surface over which the lens moves for a given amount of travel, as distinguished from the amount of travel which is controlled by the adjustment of the cam. That is to say, an adjustment of the roller 59 toward the right will insure a movement of the lens over the right hand portion only of the stone for a specific throw, while positioning it at the center will insure a movement over the central portion while positioning it at the left will insure the movement being at the left hand portion only. In addition, the roller may if desired be so shifted as to be entirely away from the cam so that there will be no movement of the carriage across the stone except such as may be manually imparted to it or may be imparted through the engagement of the beveling former 30 with its contact 31. In the latter event if desired the spring 40 may be disengaged from the hook 65 normally holding the same and may instead be engaged with the hook or pin 66, so that the tension of the spring will be exerted to hold the former 30 against its contact, in which event the beveling will be entirely automatic.

In Fig. XVI, I have illustrated a different arrangement of the parts for accomplishing the reduction in speed and also for attaining as compact and inconspicuous as possible arrangement of the several parts. In this form of construction I have secured on the grind-stone shaft 3 the hollow casing 66, on which is mounted the stone 5 and within which is contained the reduction gearing comprising the pinion 46, the gear 48, pinned to the side of the hood, and the gear 47 keyed to the rotatable bushing 67, bearing on its outer end the sprocket 68 connected by the chain 70 with the sprocket 71 mounted on the shaft 11.

The great advantages of this construction should be at once apparent since it will be

seen that the space occupied by the several gears is within the stone, and such as would otherwise be wasted, while the chain and sprockets are contained in a chamber formed in the side of the hood and are concealed by the cover plate 72, it being moreover possible with this construction to have these several parts running in oil and consequently practically noiseless.

In this form of the invention to permit of disconnecting the driving means from the spindle 11 and carriage, I form in the spindle 11 the key-way 73, in which is slidably engaged the key 74 of substantially U-shape having one end adapted to fit into the key-way formed interiorly in the sprocket 71 and having the other end engaged in the shifting spool 75. A spring 76 serves to normally lock the spool in inwardly shifted position to retain the key 74 operatively connecting the shaft and sprocket. When it is desired to stop the movement of the carriage and parts carried thereby without interfering with the movement of the stone, it is merely necessary to grasp the slowly rotating spool 75, as with the fingers, and pull the same outwardly, when the key will slide out of the key-way in the sprocket and the sprocket will be free to rotate on the shaft 11.

In this form of the invention it is desirable that the sprocket and chain being concealed be held against any lateral movement, and the key-way 73 is, therefore, made sufficiently long so that the spindle 11 may move back and forth with the carriage through the sprocket in place of the sprocket and chain swinging back and forth with the carriage, as is the case with the form illustrated in Fig. XV.

As has been mentioned in connection with Fig. VI, a suitable screw threaded device is preferably employed to clamp the lens in position between the lens clamping pads. The particular form preferred to be used in connection with that form of my invention in which both of the lens clamping spindles are driven, is illustrated in Fig. XVII, in which the lens clamping spindle 18 is keyed to rotate with the tubular shaft 80 driven by the gear 54 while said gear 54 is provided with the internally threaded hub 77 into which fits the exteriorly threaded portion of the right and left hand threaded adjusting nut 78, the exterior being threaded in one direction and the interior threaded in the opposite direction to engage the threaded end 79' of the shaft 18, whereby relatively slight rotative movement of the nut 78 causes a considerably greater sliding movement of the lens clamping spindle 18. A suitable thrust bearing 79 serves to take from the tubular shaft 80 the side pressure which would otherwise be exerted by tightening of the nut 78 to clamp a lens in position within the holder.

From the foregoing description taken in connection with the accompanying drawings it will be seen that I have provided an extremely desirable machine for the intended purpose, in which the various operating parts are supported by the hood and are removable therewith, thus eliminating both the necessity for specially constructed bases and supports for the lens carriage, etc., and also allowing of the hood, carriage, etc., being readily transferred from one stone to another, as when one stone has become worn or when it is desired to use the stone for another purpose, the complete edging attachment being thus removable without requiring any dismantling thereof, and leaving the stone and stand and tub therefor free from any part which would otherwise interfere with any desired use of it.

It will further be noted that on account of the suspension of the various parts from the hood, the hood may be readily fitted, as shown in Fig. V, with a pair of attachments, one working on each side of the stone, and in addition on account of this style of suspension the entire carriage may readily be swung back into raised position against the hood, as indicated at the right in Fig. V, rendering the parts readily accessible for insertion or removal of a lens or for any desired examination of either the lens or carriage at a point removed from the stone and in clear view in place of the parts being at all times held near the stone and difficult of access, as has been the case with all previously known constructions.

It will further be noted that I have provided an improved machine which will serve to satisfactorily edge to exact size and shape both frameless and bevel edge lenses and will permit of performance of both of these operations without the addition or removal of parts of the machine.

It will further be noted that I have provided improved means as illustrated in Fig. IV for keeping the plain surface of the stone in smooth and true condition, said means comprising a supplementary hone bearing frame 81 pivoted on the spindle 11 and moving with the spindle and carriage across the face of the hood, its hone 82 depending through the slot 83 in the stone to automatically travel back and forth across the face of the stone during the operation of the edger.

I claim:

1. In an edging machine, the combination with a stone and a carriage mounted adjacent the stone the carriage having a fixed lens clamp and the stone having portions for rimless edging and portions for bevel edging of a lens when held by the clamp, of means for shifting the carriage across the stone when a lens is being ground with a flat edge, and additional means for control-

ling the movement of the carriage across the stone when the lens is having a bevel ground thereon.

2. In an edging machine, the combination with a stone having a portion for grinding a flat edge on a lens and a portion for beveling the edge of a lens, of a lens holding carriage, a pair of lens clamp spindles rotatably mounted in the carriage, and means on the spindles for guiding the movement of the lens and carriage when the flat edge is being ground on the lens and for similarly guiding the parts when a bevel edge is being ground on the lens.

3. In an edging machine of the character described, the combination with a stone and a hood therefor, of a lens holding carriage pivotally supported adjacent the stone, means impelling the carriage toward the stone, an adjustable device carried by the hood for limiting the movement of the carriage toward the stone, and an indicator also carried by the hood and having a portion engaging the adjustable means for indicating the amount of adjustment thereof.

4. In a machine of the character described, the combination with a stone and a support therefor, of a carriage mounted adjacent the stone and provided with lens clamping means, means for moving the carriage toward the stone, driving connections between the stone and the lens clamping device of the carriage, said connections including a rotatable casing bearing a pinion, a fixed gear meshing with the pinion, and a movable power transmission gear also meshing with the pinion and having a different number of teeth from the number of teeth of the fixed gear.

5. In an edging machine, the combination with a tub, of standards rising therefrom, a stone shaft journaled on the standards, a stone mounted on the shaft, a hood for the stone carried by the standards, said hood having a lip curving outwardly therefrom, a lens carriage slidably supported by the lip, an adjustable contact carried by the hood, and an adjustable cam carried by the lens carriage and engaging the contact, whereby rotation of the cam serves to move the carriage across the face of the stone, substantially as illustrated.

6. In an edging machine, the combination with a stone and a hood over the stone, of a projection on the hood, the hood receding above and the stone projecting below the hood projection, and a lens carriage pivoted to the projection, whereby the carriage may be swung downwardly into engagement with the stone or may be swung upwardly past its point of pivotance to rest against the hood in raised position, substantially as illustrated.

7. The combination with a grinding stone, of a hood therefor, a lens holding carriage

slidably and pivotally connected to the hood, independent and separate means on the hood for impelling the carriage toward the stone and for limiting the movement of the carriage toward the stone, means for indicating the possible amount of movement of the carriage toward the stone, and a compensating device on the indicating means whereby the same may be set for different stones or to compensate for wear in any of the parts.

8. The combination with a grind stone having portions for plain and portions for bevel edging of a lens, of a lens carriage supported adjacent the stone, means for resiliently forcing the carriage in one direction transversely of the stone, and a plurality of means adapted to be independently and successively operated to control movement of the carriage over the plain and bevel edging portions of the stone in a direction opposite to that in which it is resiliently forced.

9. In a lens edging machine, the combination with a single stone having portions for plain and portions for bevel edging of a lens, of a carriage supported adjacent the stone for movement transversely of the surface thereof, said carriage having a single lens holding means, means for resiliently shifting the lens carriage in one direction transversely of the surface of the stone, cam means for shifting the carriage in the opposite direction over the plain portion of the stone, and supplemental cam means for shifting the lens carriage over the bevel edging portion of the stone when the first cam means are shifted into inoperative position, substantially as and for the purpose described.

10. A lens edging machine, including a stone having a plurality of distinct operative portions on the surface thereof, a lens carriage mounted adjacent the stone, means for automatically shifting the carriage in one direction, a plurality of independently operable controls for regulating the shifting of the carriage in the opposite direction over predetermined portions of the stone, and a single set of means for limiting the movement of the carriage in the direction of the stone during the operation of the several transverse shifting means, substantially as and for the purpose described.

11. In a lens edging machine, the combination with a support and a laterally shiftable carriage mounted thereon, of a later-

ally adjustable contact on one of said parts, an adjustable rotatable cam on the other of said parts adapted to engage the contact, means for holding the parts in engagement one with the other whereby rotation of the cam or contact will cause relative lateral movement of the carriage and support, means for locking the contact in desired laterally adjusted position or for locking it out of engaging position with the cam, as desired, a supplemental cam carried by the carriage and a supplemental contact on the support adapted to engage the supplemental cam on the carriage to control the lateral movement of the carriage when the first mentioned contact and cam are moved into inoperative position, substantially as and for the purpose described.

12. A lens-edging machine, including a support, a transversely shiftable carriage on the support, yielding means for actuating the carriage in one direction, means for shifting the carriage in the opposite direction against the yielding means and a cam for shifting the carriage against the action of the yielding means when the shifting means and cooperating parts are moved into inoperative position.

13. In a lens edging machine, the combination with a support and a swinging carriage slidably mounted thereon, of a former on the carriage, a contact on the support, means for holding the contact and former interengaged to control swinging movement of the carriage in the direction of the support, resilient means for laterally shifting the carriage in one direction relative to the support, a main cam for shifting the carriage in the opposite direction against the actuating spring therefor, a supplemental cam for similarly shifting the carriage a lesser amount when the main cam is moved into inoperative position, and contacts on the support for engaging each of the said cams, the face of the former engaging contact on the support being of sufficient length to remain in engagement with the former of the carriage irrespective of the particular cam which is brought into operation.

In testimony whereof I affix my signature in the presence of two witnesses.

LUCIAN W. BUGBEE.

Witnesses:

HAROLD K. PARSONS,
EDITH M. HALVORSEN.