

D. D. SULLIVAN,
LENS GRINDER.
APPLICATION FILED MAY 31, 1918.

1,331,037.

Patented Feb. 17, 1920.

2 SHEETS—SHEET 1.

Fig. 1,

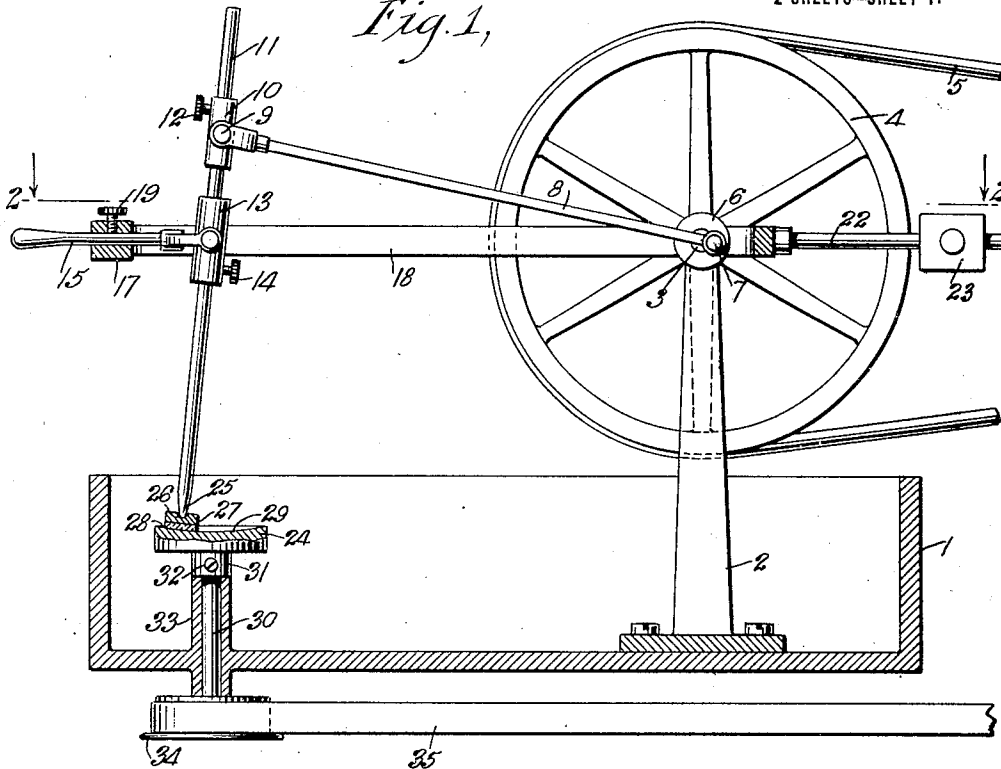
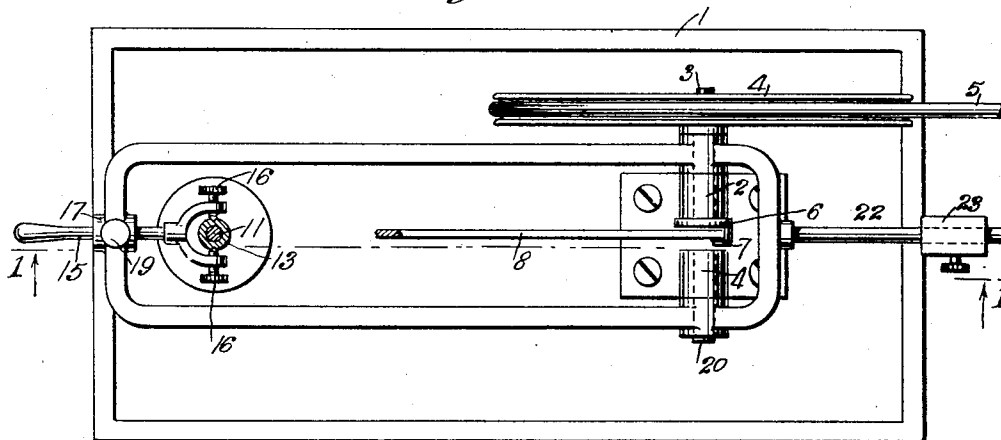


Fig. 2,



WITNESSES

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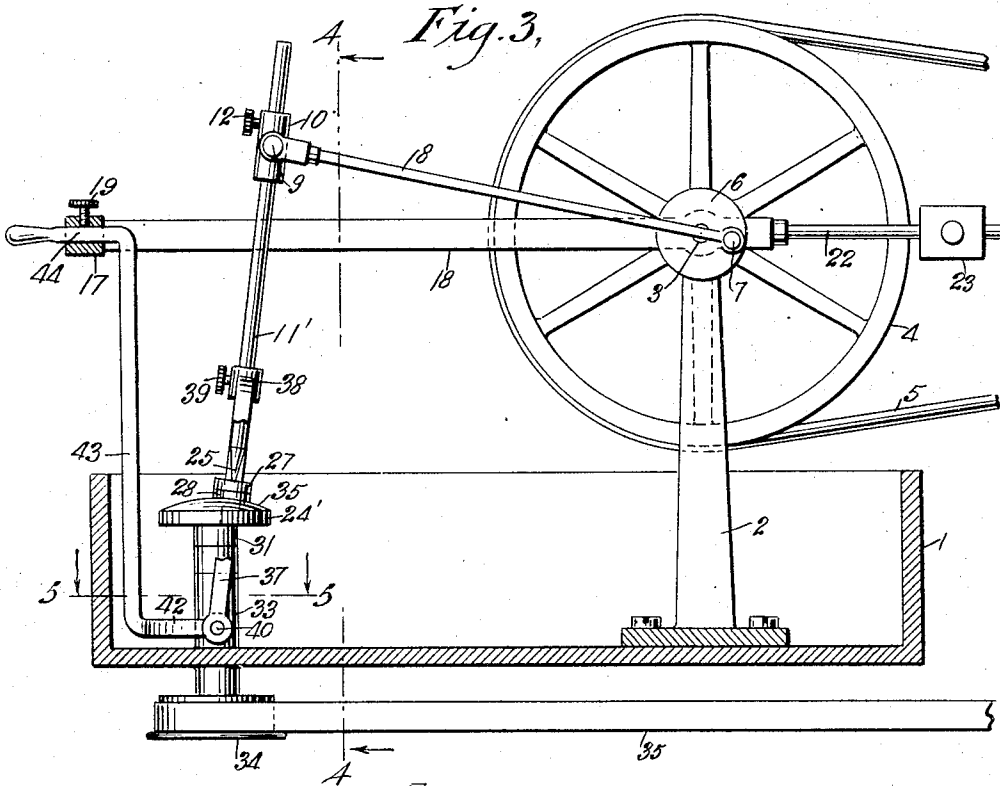
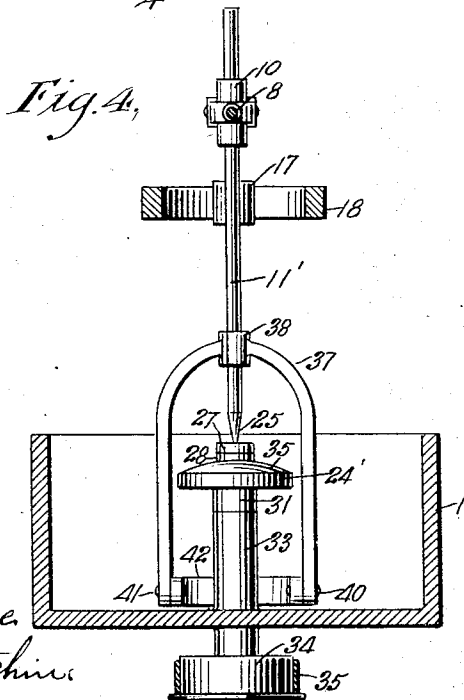
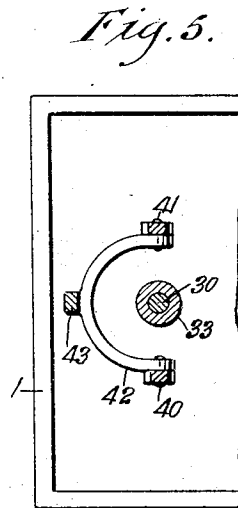
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UNITED STATES PATENT OFFICE.

DANIEL D. SULLIVAN, OF FARGO, NORTH DAKOTA.

LENS-GRINDER.

1,331,037.

Specification of Letters Patent.

Patented Feb. 17, 1920.

Application filed May 31, 1918. Serial No. 237,445.

To all whom it may concern:

Be it known that I, DANIEL D. SULLIVAN, a citizen of the United States, and a resident of Fargo, in the county of Cass and State of North Dakota, have invented a new and Improved Lens-Grinder, of which the following is a full, clear, and exact description.

This invention relates to lens grinding machines and has for an object the provision of an improved construction whereby the grinding operation is performed substantially in the same manner as when done by hand.

Another object in view is to provide an improved construction which may be set up to grind either concave or convex lenses.

A still further object of the invention is the provision of an improved arrangement whereby the mechanism for moving the lenses during the grinding operation may be adjusted to the curvature of the lens to be ground.

In the accompanying drawings:

Figure 1 is a longitudinal vertical section through a machine embodying the invention, same being taken through Fig. 2 on line 1—1.

Fig. 2 is a top plan view of the machine shown in Fig. 1.

Fig. 3 is a sectional view similar to Fig. 1, but showing a slight modified form for grinding concave lenses.

Fig. 4 is a transverse sectional view through Fig. 3 on line 4—4.

Fig. 5 is a detail fragmentary sectional view through Fig. 3 on line 5—5.

Referring to the accompanying drawings by numerals 1 indicates a pan of any desired kind which carries an upstanding bracket 2 for supporting shaft 3. Shaft 3 carries a pulley 4 which is driven by a belt 5 connected to any suitable source of power. Shaft 3 has a disk 6 connected therewith near the end opposite the end carrying the pulley 4, disk 6 carrying a wrist pin 7 extending through the end of rocker arm 8, whereby said rocker arm is given a back and forth motion. The front end of the rocker arm 8 is pivoted at 9 to sleeve 10 which sleeve is slidingly mounted on rod 11. A set screw 12 is provided in sleeve 10 for locking the sleeve in any adjusted position so as to vary the stroke of the lower end of the rod 11. A second sleeve 13 is

slidingly fitted on the rod 11 and is clamped thereto at any desired point by set screw 14. This sleeve is connected with an adjusting rod 15 through set screws 16 which act as journal members whereby the sleeve and rod 11 may be swung freely, but are held in a given position by the rod 15, which rod is slidingly mounted in an enlargement 17 on the frame 18 and a set screw 19 extends through the enlargement 17 for locking the rod in any desired position. Frame 18 is pivotally mounted on shaft 3 and also on a stub shaft 20 carried by bracket 21 whereby the frame may move upwardly or downwardly freely and may act as a weight or tension member for pressing downwardly rod 11 and the lenses carried thereby. In order to regulate the downward pressure caused by the weight of the frame 18 and associated parts an arm 22 is provided at the rear end of the frame, namely the end opposite the enlargement 17, said arm carrying an adjustable weight 23 which may be locked in an adjusted position by a suitable set screw. By this construction and arrangement any desired downward pressure may be exerted on rod 11 while the rod is oscillated back and forth by rocker 8, pin 7, disk 6 and associated parts. In order to vary the length of the stroke of rod 11 at the lower end sleeve 10 is raised or lowered, while an adjustment of the rod 15 will vary the position of the lower end of rod 11 on the lap 24. To vary the radius of movement of the rod 11 sleeve 13 is moved longitudinally of the rod in either direction. The lower end of the rod 11 is provided with an extension 25 having a fairly sharp end fitting into notch 26 in block 27. Block 27 carries the lens 28 to which it is secured by an adhesive of any desired kind, whereby the free face may rub against the curved surface 29 of lap 24. A suitable grinding material is provided in the lap for grinding the lens. In order to produce the desired grinding action the lap 24 is rotated by shaft 30 to which it is secured by any suitable means, as for instance by having a hub 31 fit over shaft 30 and then secured thereto by a set screw 32. A standard 33 carries the shaft 30, said standard acting as a support for the lap 24 and as a guide for said shaft. Shaft 30 is driven by a pulley 34 which in turn is driven by a belt 35 receiving power from any suitable source. It

is, of course, evident that other driving means could be provided for shaft 30 so as to arrive at any desired speed while the rod 11 is moved back and forth at any desired speed. After the lens has been properly ground and it is desired to polish the same lap 24 is removed and a polishing head substituted, or if desired the lap is left in place and a polishing cloth of suitable material is placed thereon for producing a polishing action and the various parts are caused to continue to act as if the lens was being ground. As the curvature of any particular lap 24 must remain the same the sleeves 10 and 13 must be adjusted to agree with the particular curvature of any particular lap used.

In Figs. 3 to 5 will be seen a slightly modified arrangement or rather re-adjusted member to grind a convex lens instead of a concave lens. This, of course, necessitates the use of a lap 24' having a convex surface 35 instead of a concave surface similar to the surface 29 of lap 24. The rod 11' operated by the rocker arm 8 is of the same structure as the rod 11, but the movement of the lower end thereof is controlled by an inverted U-shaped member 37 as shown in Fig. 4 which has a sleeve 38 slidably mounted on the rod 11' and clamped thereto whenever desired by a set screw 39. The inverted U-shaped member 37 is pivotally connected at 40 and 41 to a U-shaped support 42 which has an upstanding rod 43 rigidly connected therewith or formed integral therewith, said upstanding rod having a bent over section or handle 44 projecting through the enlargement 17 of frame 18. The set screw 19 regulates the position of the section or handle 44 so as to vary the pivotal point on which the rod 11' operates. The radius of movement of the block 27 operated by the extension 25 at the lower end of rod 11' moves on a radius the center of which is the center of the pivotal connection 41. This arrangement provides for the same adjustment as shown in Fig. 1 whereby a concave lens may be ground in a similar manner to the convex lens and the polishing action may be the same whereby a uniform product will be produced and also the product will have the perfection caused by an even action produced by machinery. In grinding lenses by hand the operator must know his business thoroughly in order to produce the right pressure and an even grinding throughout, whereas the action of the machine for grinding both the concave and convex sides is uniform both in the amount of movement given and the pressure on all parts.

What I claim is:

1. A lens grinding machine comprising a lap, means for rotating the lap, a block for holding the lens against the lap, a rod for moving the block back and forth over the lap, a supporting standard, a frame pivotally mounted at one end of said supporting standard, a supporting handle adjustable longitudinally of said frame arranged at the free end of the frame, a sleeve surrounding said rod, means for pivotally connecting said adjustable handle with said sleeve, means for locking said sleeve to said rod at any point along the rod, and means acting on the rod for moving the same pivotally.

2. A lens grinding machine comprising a lap, means for rotating the lap, a lens holding block, a rod engaging the lens holding block for moving the same back and forth over the lap, a supporting sleeve loosely mounted on said rod, means for securing said sleeve to said rod at any point along the rod for bearing the throw of the rod, means for pivotally supporting said sleeve, a horizontally adjustable handle extending through to the free end of said frame whereby part of the weight of the frame is brought to bear on said rod, an adjustable power sleeve mounted on said rod, and means for moving said adjustable power sleeve back and forth whereby the rod will be moved back and forth.

3. A lens grinding machine comprising a rotatable lap, a block for holding a lens thereon, a rod for actuating said block, a supporting sleeve mounted on said rod, a rocking sleeve mounted on said rod, a rocker arm pivotally connected to the rocking sleeve, means for substantially reciprocating said rocker arm for swinging said rod back and forth, a pivotally mounted frame, and means for adjustably connecting said supporting sleeve to said frame at its free end whereby the frame will cause downward pressure on said rod.

4. A lens grinding machine comprising a lap, means for rotating the lap, an oscillating arm for moving a lens supporting block across the lap, a sleeve adjustably mounted on said arm, a support for said sleeve, a frame carrying said support at one end, means for pivotally mounting said frame at the other end whereby one end of the frame will press downwardly on said sleeve, said support being adjustable toward and from the end of said frame, means for counter-balancing said frame, and means for oscillating said frame.

DANIEL D. SULLIVAN.