March 27, 1934. J. J. McCABE 1,952,212

LENS GRINDING MACHINE

Original Filed Sept. 10, 1931 2 Sheets-Sheet 1

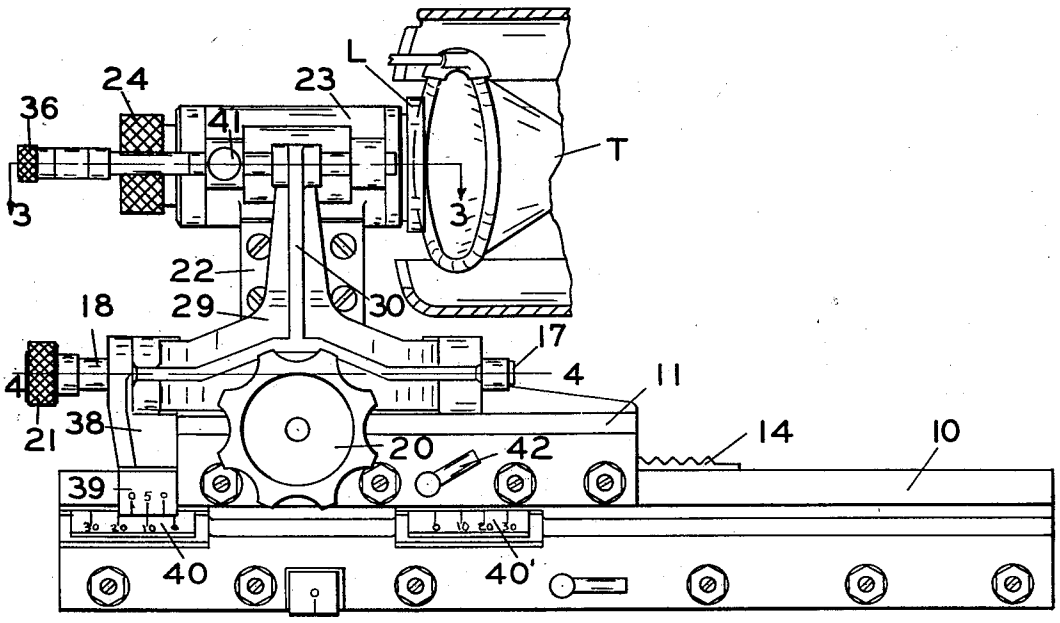


FIG. 1

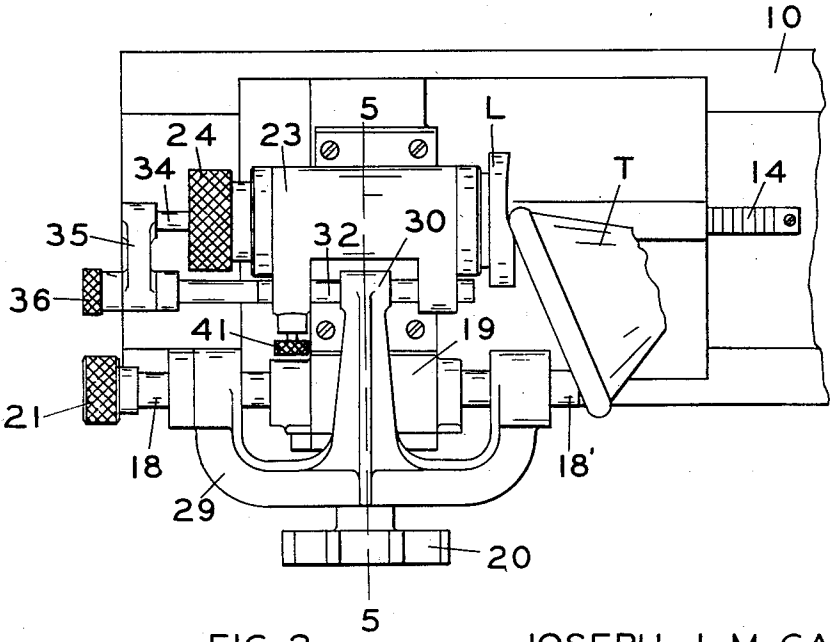


FIG. 2

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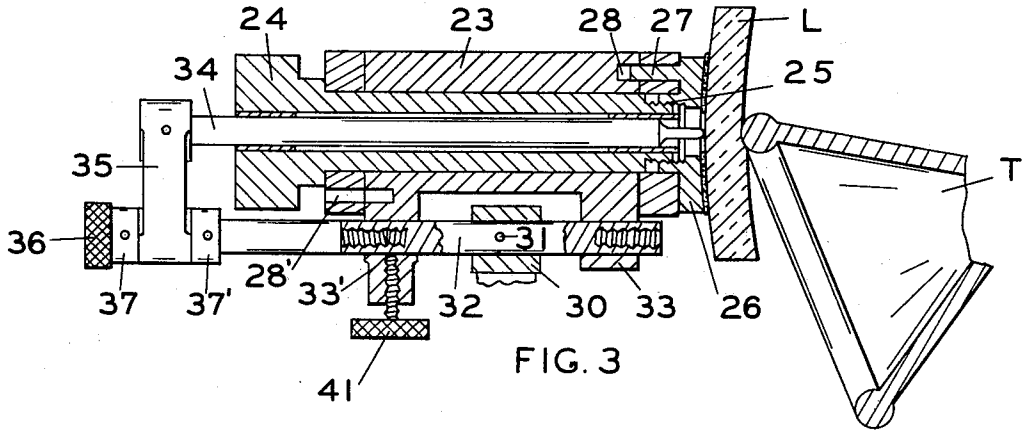


FIG. 3

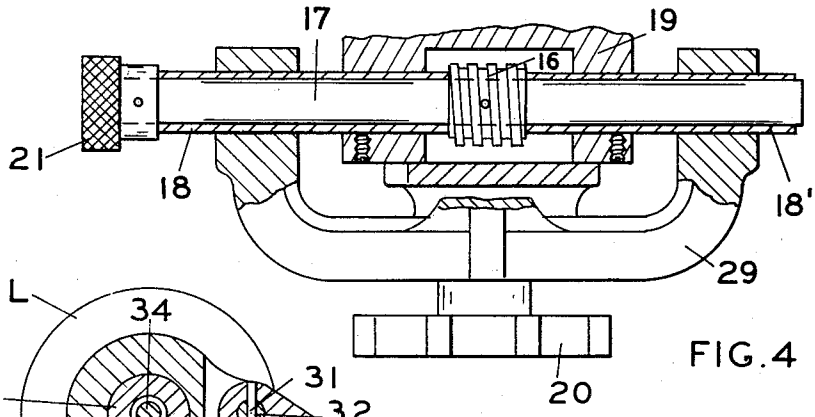


FIG. 4

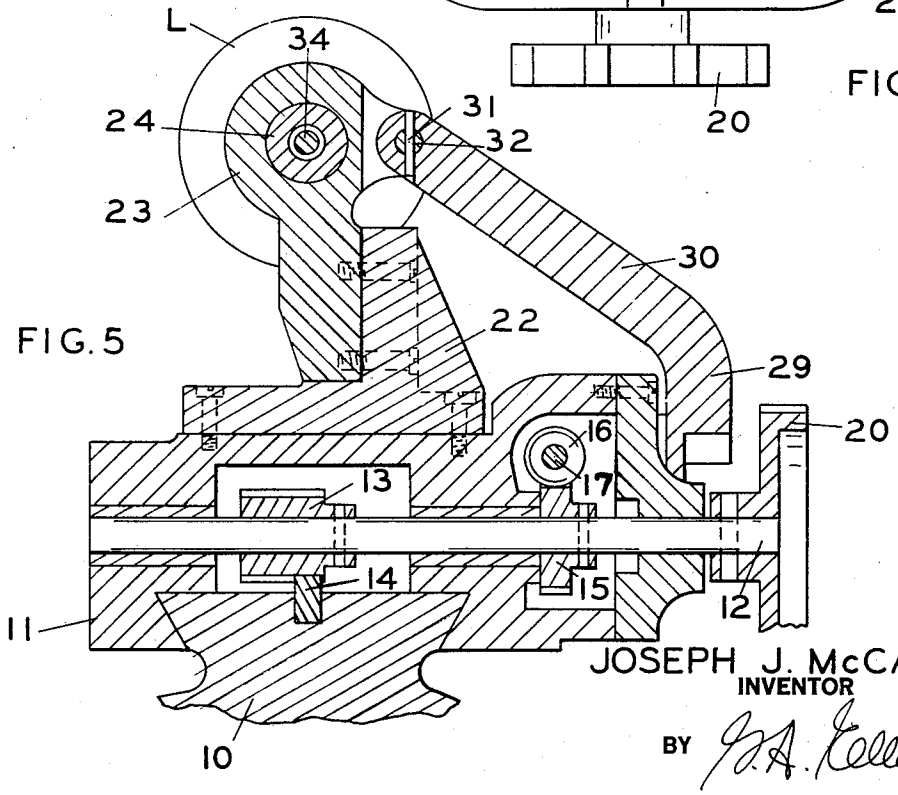


FIG. 5

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LENS GRINDING MACHINE

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Original application September 10, 1931, Serial No. 562,018. Divided and this application November 7, 1931, Serial No. 573,569

7 Claims. (Cl. 51—216)

This invention relates to lens grinding machines and more particularly it has reference to a device for supporting the lens during the grinding operation.

This application is a division of my copending application Serial No. 562,018, filed Sept. 10, 1931. The subject matter of the instant application is disclosed, in modified form, in my copending application Serial No. 181,202 filed April 15, 1927, and now matured into Patent No. 1,901,181 issued on March 14, 1933.

My invention is especially adapted for use in connection with a lens grinding machine such, for example, as that disclosed in either of my co-pending applications Serial Nos. 181,202 and 562,018 wherein a single lens blank is ground by producing a relative movement between the blank and an abrading tool along an arcuate path. In order that the finished lens might have the required thickness, it is necessary to provide means whereby the lens blank and the cutting tool can be adjusted relative to each other.

One of the objects of my invention is to provide an improved device for holding a lens on a lens grinding machine. Another object is to provide, on a lens grinding machine, an adjustable work holder which can be positioned so as to provide finished lenses of various thicknesses. A further object is to provide a lens holder which is adjustable with respect to an abrading tool and provided with scale means for indicating the thicknesses of finished lenses. A still further object is to provide, on a lens grinding machine, a lens holder having scale means and a locating member adapted to contact with a surface of a lens on the holder whereby thicknesses of finished lenses may be determined. These and other objects and advantages reside in certain novel features of construction, arrangement and combination of parts as will hereinafter be more fully described and pointed out in the appended claims.

Referring to the drawings:

Fig. 1 shows a front elevation of my improved lens holding device mounted on the slide of a lens grinding machine.

Fig. 2 is a top plan view of same.

Fig. 3 is an enlarged sectional view taken on line 3—3 of Fig. 1.

Fig. 4 is an enlarged sectional view taken on line 4—4 of Fig. 1.

Fig. 5 is an enlarged sectional view taken on line 5—5 of Fig. 2.

A preferred embodiment of my invention is shown in the drawings wherein 10 indicates a slide which is moved so as to carry the lens blank L in an arcuate path into contact with a rotating abrading tool T, as is fully disclosed in my co-pending application Serial No. 562,018. Movably mounted on the slide 10 is the head slide 11 which carries the lens holding means which will hereinafter be described. As shown in Figs. 4 and 5, a shaft 12 is slidably and rotatably mounted on slide 11 and carries a pinion 13 which cooperates with a rack 14 secured to the top of slide 10. Shaft 12 also carries another pinion 15 which is adapted to be selectively moved into cooperation with a worm 16 carried by shaft 17 which is rotatably mounted within the two tubes 18 and 18' which are fixed to a member 19 secured to head slide 11 as shown in Figs. 4 and 5. Shaft 12 carries a knob 20 and shaft 17 carries a knob 21. From the foregoing it will be apparent that by pulling out the shaft 12 the pinion 15 will be disengaged from the worm 16 but the pinion 13 will still engage rack 14 so that the head slide 11 may be moved back and forth on slide 10 by turning knob 20. When an approximate position of the slide 11 is reached, the shaft 12 is pushed inwardly so that the pinion 15 engages the worm 16 and fine adjustment of the slide 11 can then be effected by turning knob 21.

Secured to slide 11 is a support 22 carrying a cylindrical member 23 within which is rotatably mounted a bushing 24 having a threaded portion 25 adapted to engage a threaded portion on the lens block 26 to which a lens blank L is cemented. The lens block has a locating pin 27 adapted to selectively cooperate with either of the openings 28 or 28' in the member 23, as will hereinafter be described. Slidably mounted on the rigidly held tubes 18 and 18' is a bracket 29 having an upwardly projecting arm 30 which is secured by a pin 31 to a rod 32 which is slidably mounted in bearings 33 and 33' formed integral with member 23. Slidably mounted within the bushing 24 is the locating pin 34 which is fixedly secured to one end of link 35. In the other end of link 35 a screw 36, held in place by collars 37 and 37', is rotatably mounted. The end of the screw is adapted to selectively engage either threaded end of rod 32. When the screw 36 is threaded into rod 32 and the locating pin 34 is moved into contact with the rear surface of lens blank L, the rod 32 slides in its bearings and the attached bracket 29 slides on the tubes 18 and 18'. Secured to bracket 29 is a depending arm 38 carrying an index plate 39 which is adapted to selectively cooperate with either scale 40 or 40' secured to slide

10, as will hereinafter be described. The rod 32 is locked in adjusted position by set screw 41 and after the index plate 39 has thusly been adjusted and locked, the slide 11 and the entire mechanism carried thereby are adjusted by turning knobs 20 and 21 and locked in position by screw 42.

In operating the machine to produce a concave surface on a lens the slides are adjusted as described in my co-pending application Serial No. 562,018. The lens block 26, carrying a suitably mounted lens blank L, is then secured in position by means of the threaded bushing 24. The set screw 41 is then loosened, the locating pin 34 is moved into contact with the rear of the lens blank and screw 41 is then tightened. When the pin 34 is moved, the rod 32 and the attached bracket 29, carrying index plate 39, also move with the rod. The slide 11 is then adjusted by knobs 20 and 21 so that the index plate 39 indicates the desired lens thickness on scale 40, after which the machine is operated to produce the surface.

When it is desired to produce a convex surface, a similar procedure is followed but the lens block 26 is mounted at the opposite end of the cylindrical member 23. This is accomplished by removing the bushing 24 and locating pin 34 and inserting them in the opposite end of member 23. The screw 36 is attached to the opposite end of threaded rod 32 and the pin 27 on block 26 then cooperates with the opening 28'. When producing a convex surface, the thickness of the lens is determined by scale 40' in cooperation with index plate 39.

From the foregoing it will be apparent that I am able to attain the objects of my invention and provide an improved type of work holder for a lens grinding machine. Various modifications can obviously be made without departing from the spirit of my invention.

I claim:

1. A lens grinding machine having in combination work holding means comprising a support, devices for detachably securing a lens to said support, a locating pin slidably mounted on said support and means for moving said pin into contact with the face of the lens which is adjacent to said devices, scale means spaced from and movable with said locating pin, said scale means being arranged to cooperate with other scale means carried by said support.

2. In a lens grinding machine the combination of a support, a tubular member carried by said support, means for detachably holding a lens on said member, a locating pin slidably mounted within said tubular member, a bracket secured to said pin and movable therewith, scale means carried by said bracket and arranged to cooperate with scale means on said support.

3. In a lens grinding machine the combination of a tool, a support, a slide mounted on said support, a member secured to said slide, means for detachably securing a lens to said member, a locating pin movably mounted on said member and adapted to be brought into contact with the lens on said member, a bracket movably mounted on said slide, said bracket being connected with said pin, said slide being movably mounted on said support to adjustably position the lens relative to said tool and means for indicating the position of said lens relative to the tool, said means comprising an index plate carried by said bracket and cooperating scale means on said support.

4. A lens grinding machine having in combination an abrading tool, a support, a slide mounted on said support, a holder on said slide for detachably holding a lens, said slide being movably mounted on said support whereby the lens may be adjustably positioned with respect to said tool, and means for determining the amount of movement of said slide, said means comprising scale means carried by said support and a cooperating index plate which is movably mounted on said slide, said index plate being operatively associated with movable locating means arranged to be moved into contact with said lens.

5. In a lens grinding machine the combination of a support, a slide movably mounted on said support, a tubular member carried by said slide, means for detachably securing a lens to said member, a locating pin slidably mounted within said member and adapted to contact with the lens, a rod slidably mounted on said member, a link rigidly connecting said pin and rod, a bracket movably mounted on said slide, said bracket being connected to said rod, scale means carried by said support and an index plate carried by said bracket, said index plate and scale means cooperating to indicate the position of said slide on the support.

6. In a lens grinding machine, the combination of a support, devices for detachably holding a lens block on said support with a lens blank having one of its faces adjacent to the block, a locating member movable into and out of contact with the face of the blank which is adjacent to said block, an index plate connected to and movable with said member and scale means on said support positioned to cooperate with said index plate.

7. In a lens grinding machine, the combination of a tool, a support, a slide movably mounted on said support, a member on said slide for detachably holding a lens blank in operative relation to said tool, a locating element movably mounted on said member and positioned to be brought into contact with the surface of the lens blank which is remote from said tool, an index plate connected to and movable with said element and scale means on said support arranged to cooperate with said index plate.

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