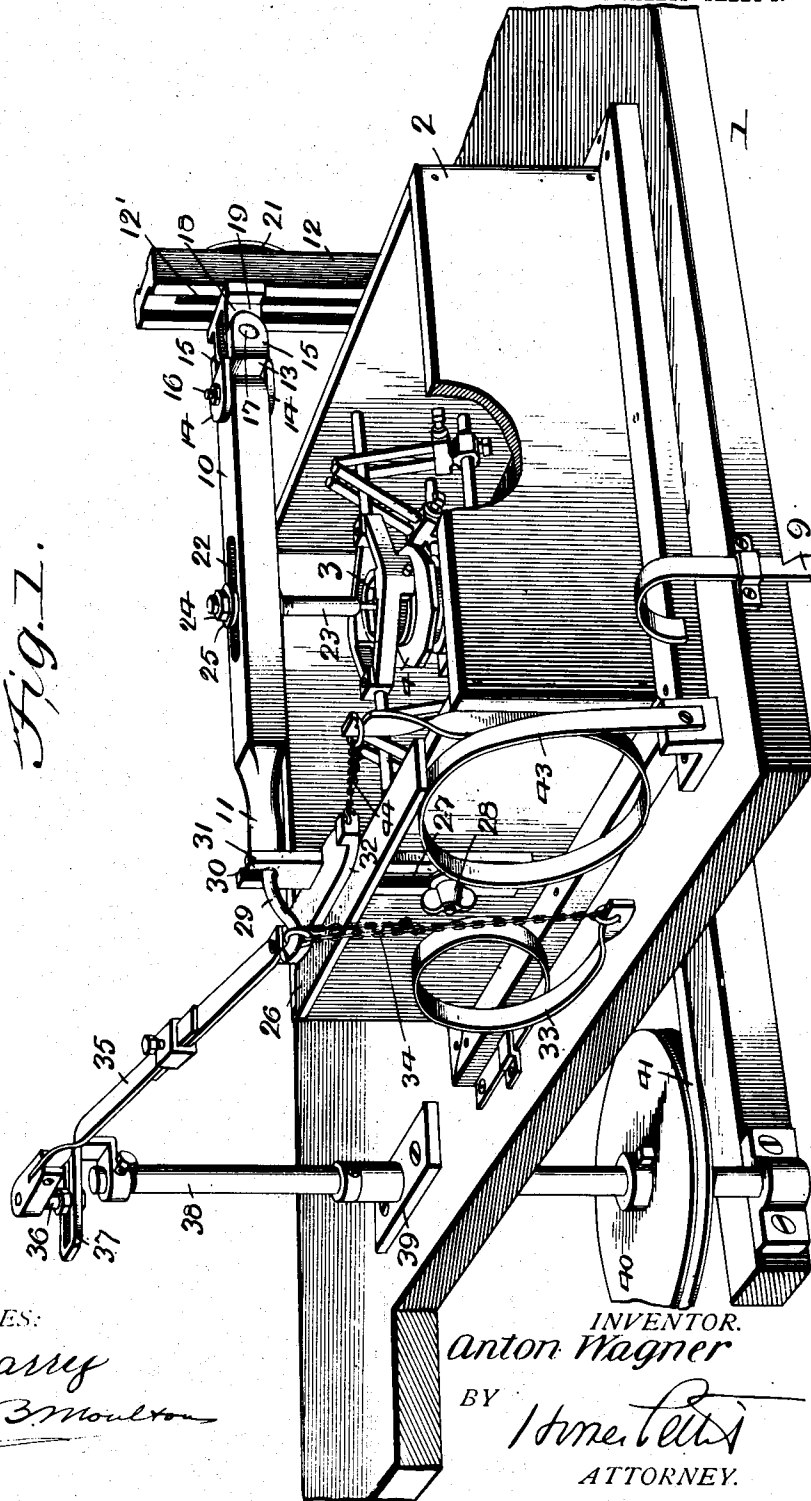


No. 839,345.

PATENTED DEC. 25, 1906.

A. WAGNER.
LENS GRINDING MACHINE.
APPLICATION FILED FEB. 2, 1906.

2 SHEETS—SHEET 1.



No. 839,345.

PATENTED DEC. 25, 1906.

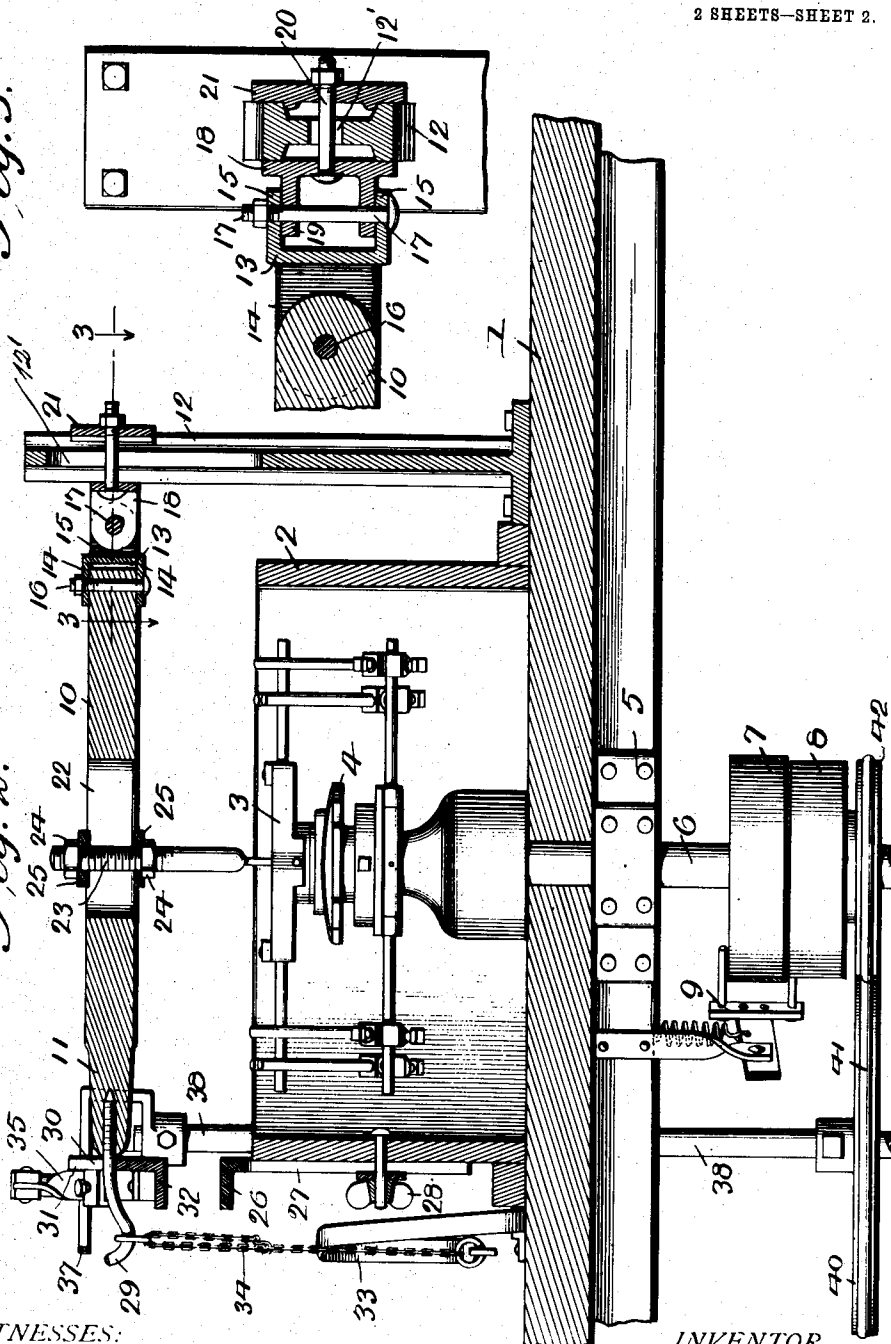
A. WAGNER.
LENS GRINDING MACHINE.

APPLICATION FILED FEB. 2, 1906.

2 SHEETS—SHEET 2.

Fig. 3.

Fig. 2.



WITNESSES:

F. C. Barry
Alton B. Moulton

INVENTOR.

Anton Wagner

BY

10me. [Signature]
ATTORNEY.

UNITED STATES PATENT OFFICE.

ANTON WAGNER, OF PHILADELPHIA, PENNSYLVANIA.

LENS-GRINDING MACHINE.

No. 839,345.

Specification of Letters Patent.

Patented Dec. 25, 1906.

Application filed February 2, 1906. Serial No. 299,170.

To all whom it may concern:

Be it known that I, ANTON WAGNER, a citizen of the United States, residing in the city and county of Philadelphia, State of Pennsylvania, have invented a new and useful Improvement in Lens-Grinding Machines, of which the following is a full, clear, and complete disclosure.

My invention relates to those lens-grinding machines in which a rotary motion and also a reciprocating motion in one direction are given to one of a pair of grinding members, such a machine being disclosed and illustrated in the United States Patent No. 646,672, granted to me April 3, 1900.

The object of the present invention is to render such a lens-grinding machine automatic in its operation and to provide it with means for causing one of the grinding members to perform as closely as possible the motions usually given to it at the hands of a skilled operator.

Briefly, my invention consists in providing a machine such as is shown in the said patent with a simple and efficient means for reciprocating the upper grinding member.

For a full, clear, and exact description of my invention reference may be had to the following specification and to the accompanying drawings, forming a part thereof, in which similar figures of reference indicate corresponding parts in the various views.

Figure 1 shows in perspective my improved lens-grinding machine. Fig. 2 is a vertical central section of the same. Fig. 3 is a section on line 3-3 of Fig. 2, showing a detail of my invention.

1 indicates a base-plate upon which is mounted a casing 2, inclosing the lens-grinding machine, of which 3 indicates the upper grinding member and 4 the lower grinding member. Mounted on the base 1 in bearings 5 is the driving-shaft 6, by which motion is communicated to the grinding-surfaces and upon which is mounted the tight and loose pulleys 7 and 8, controlled by the belt-shipper 9.

10 indicates a pressure-lever by which the reciprocating motion is communicated to the upper grinding member. Said lever is provided at one end with the handle 11 and at the other end is connected to an upright post or column 12 by means of a joint shown in detail in Fig. 3. Said joint consists of a rectangular plate 13, the two opposite sides of which are provided with lugs or ears 14, ex-

tending at right angles to the plate 13. To the remaining two sides of the plate 13 are secured lugs 15 15, which also extend at right angles to the plate 13, but in a direction opposite to that of the lugs 14. The bolt 16, passing through the ears or lugs 14, secures one end of the handle to the plate and a similar bolt 17, passing through the ears 15, secures the plate 13 to a bracket 18, provided with ears 19. By this means the pressure-lever is virtually secured to the post or column 12 by a joint connection which permits the lever to be oscillated in any direction. This bracket 18 is adjustably clamped to the upright post 12 by a bolt 20, passing through the bracket 18, through a vertical slot 12' in the post 12, and through a plate 21 on the side of the post opposite to that on which the bracket 18 is located. The pressure-lever 10 is further provided with a slot 22, in which is adjustably secured a bolt 23, provided with nuts 24 and washers 25, engaging either side of the pressure-lever 10. The lower end of the bolt 23 is reduced in diameter and engages the upper grinding member.

By the above construction it will readily be seen that the lever 10 can be used to apply pressure to the upper member and also to reciprocate said member with respect to the lower grinding member. The end of the pressure-lever 10 is further provided with a hook 29, the shank of which rests within a slot 30 in the top of an upwardly-projecting lug 31, attached to a link 32. To one end of the link 32 an adjustable pitman 35 is attached, which in turn has its outer end in engagement with a crank-pin 36, mounted adjustably on the crank 37 on the upper end of a shaft 38, which, passing through a bearing 39 on the base 1, carries a pulley 40, rotated from the main driving-shaft by means of the belt 41 and pulley 42. Attached to the base or table 1 is a helical spring 33, to the free end of which the hook 29 is connected by means of a chain 34. Also secured to the base 1 is a second helical spring 43, its free end being connected to the other side of the link 32 by a chain 44.

From the above description of the construction and relation of the parts the operation is apparent. Motion being communicated to the driving-shaft 6 through the tight pulley, the grinding members will be revolved in the usual manner, and the shaft 38 will be rotated through the pulley 42, belt 41, and

pulley 40. By means of the crank 37 and connecting rod or link 35 the link 32 will be drawn in one direction, carrying with it the pressure-lever 10. When the shoe has been drawn to the full throw of the crank, it will be drawn back by the spring 43. In this manner a reciprocating motion is communicated to the lever 10 and through it to the upper grinding-surface. The spring 43 operating in opposition to the pull of the connecting-rod 35 permits the rod 35 to be made of light construction and entirely avoids the effects of backlash in the crank-and-pitman connection. By adjusting or changing the length of the chain 34 a greater or less amount of pressure can be applied to the pressure-lever 10 and through the pin or bolt 23 to the upper grinding member, while by moving the crank-pin toward or away from the center of the shaft 38 a greater or less amount of reciprocation can be given to the said grinding-surface. Upon the casing 2 is mounted a bracket 26, adjustable vertically upon the casing by means of the slot 27 and thumb-screw 28. This provides a shelf or table for the reception of the link 32 when the oscillation and the pressure-applying devices are disconnected from the end of the pressure-lever 10.

By means of the above-described invention grinding-machines which are now operated only by skilled mechanics can be rendered automatic in their movement, and, secondly, the cost of the production of compound lenses can be greatly reduced.

As the power for communicating motion to the reciprocating arm 10 is derived from the shaft which rotates the grinding-surfaces, both motions will be started and stopped at the same instant, thus insuring uniformity and perfection in the product. Furthermore, by reason of the peculiar above-described constructions the mechanism for reciprocating the lever 10 can be completely disconnected, and, if necessary, the finishing touches of the grinding can be performed, as heretofore, by the hands of a skilled mechanic. In this way one skilled workman is enabled to attend to a number of machines, and a high-grade hand-finished lens is produced.

What I claim as my invention, and desire to protect by Letters Patent of the United States, is—

1. In a lens-grinding machine, a lever, means to oscillate the same, and yielding means acting transversely to the plane of the oscillation for applying pressure to said lever.

2. In a lens-grinding machine, a lever universally pivoted at one end, means to oscillate the same, a yielding means, acting transversely to the plane of the oscillation for applying pressure to said lever.

3. In a lens-grinding machine, a lever, a universal joint by which one end of said lever

is supported, means for adjusting said joint vertically, means to oscillate said lever, and yielding means acting transversely to the plane of the oscillation of said lever for applying pressure thereto.

4. In a lens-grinding machine, a lever fulcrumed at one end, means to oscillate said lever in one direction, yielding means to oscillate the said lever in the opposite direction, and yielding means acting transversely to the plane of the oscillation for applying pressure to said lever.

5. In a lens-grinding machine, the combination of a pressure-lever, and means for oscillating the same, consisting of a crank and pitman for drawing the said lever in one direction, and an adjustable yielding means for drawing said lever in the opposite direction.

6. In a lens-grinding machine, the combination of a pressure-lever, a crank and pitman, a spring working in opposition to said crank and adjustable connection secured to said spring, a link attached to said pitman and said connector, means for connecting said link with the free end of said pressure-lever.

7. In a lens-grinding machine, the combination of a pressure-lever, a link, means for oscillating said link, a pressure-applying device, means for attaching said pressure-lever to said link and to said pressure-applying device.

8. In a lens-grinding machine, the combination with a grinding member, of a pressure-lever fulcrumed at one end, means to oscillate the said lever in a plane substantially parallel to the plane of the said grinding member, yielding means for applying pressure to said lever in a direction at right angles to the plane of the oscillation of said lever, and means for communicating the motion of the pressure-lever to the said grinding member.

9. In a lens-grinding machine, the combination with a grinding member, of a pressure-lever fulcrumed at one end, means to oscillate said pressure-lever in a plane substantially parallel to the plane of the said grinding member, means for applying pressure to said lever in a direction transversely to the plane of the oscillation of the said lever, and means for communicating the motion of the pressure-lever to the said grinding member.

10. In a lens-grinding machine, the combination with a grinding member, of a pressure-lever fulcrumed at one end, means to draw the said lever in one direction in a plane substantially parallel to the plane of the said grinding member, independent means for drawing the lever in the opposite direction, means for applying pressure to said lever in a plane transversely to the plane of the oscillation of said pressure-lever, and means for communicating the motion of the pressure-lever to the said grinding member.

11. In a lens-grinding machine, the combination with a grinding member, of a pressure-lever fulcrumed at one end, means for positively drawing the pressure-lever in one direction and in a plane substantially parallel to the plane of said grinding member, independent yielding means for drawing the pressure-lever in the opposite direction, means for applying pressure to said lever in a direction transversely to the plane of the oscillation of said pressure-lever and means for communicating the motion of the pressure-lever to the said grinding member.

12. In a lens-grinding machine, the combination with a grinding member, of a pressure-lever fulcrumed at one end and provided at the other with a hook, a link engaging said hook, means to oscillate said link, means also connected to said hook for applying a pressure to said hook transversely to the plane of the oscillation of said pressure-lever.

13. In a lens-grinding machine, the combination with the grinding members, of a driving-shaft, a supplemental shaft geared to said driving-shaft, a pressure-lever, means connected to the supplemental shaft and to said lever for drawing the lever in one direction, independent means for drawing the pressure-lever in the opposite direction,

means for applying pressure to the said lever in a direction transverse to the plane of the oscillation of said pressure-lever, and means intermediate of the ends of the lever for communicating the motion of the lever to one of the grinding members.

14. In a lens-grinding machine, the combination with the grinding members, of a driving-shaft, a lever provided at one end with the universal joint, a supplemental shaft geared to said driving-shaft, means connected to the supplemental shaft and to the free end of said pressure-lever to oscillate said lever in one direction, yielding means also connected to the free end of the said pressure-lever to oscillate said lever in an opposite direction, a second yielding means tending to move the said free end in a direction transverse to the plane of the oscillation of the lever, and means for communicating a resulting motion of said pressure-lever to one of the grinding members.

In witness whereof I have hereunto set my hand this 30th day of January, A. D. 1906.

ANTON WAGNER.

Witnesses:

J. HENDERSON,
HARRY COBB KENNEDY.