No. 772,785. PATENTED OCT. 18, 1904.

E. CLARKE.

MACHINE FOR GRINDING THE EDGES OF LENSES.

APPLICATION FILED APR. 18, 1904.

NO MODEL.

Fig. 1.

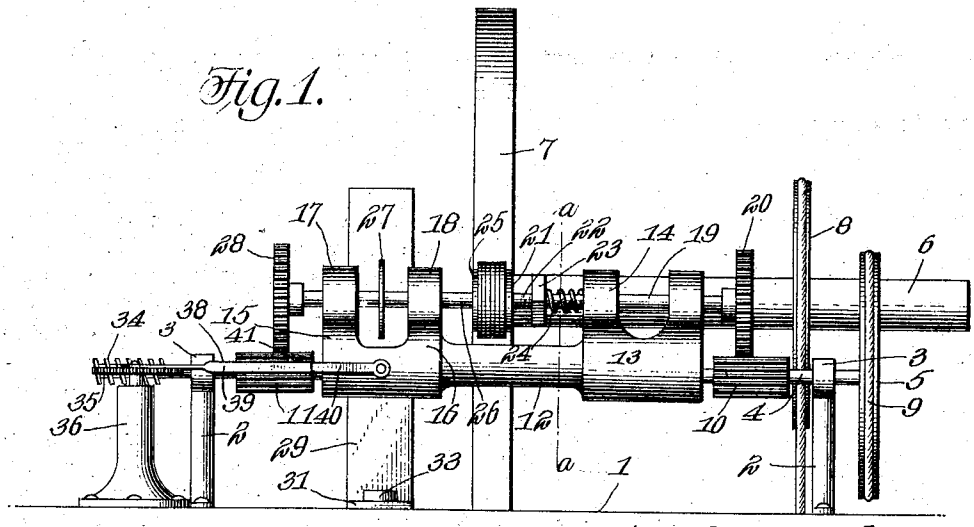


Fig. 2.

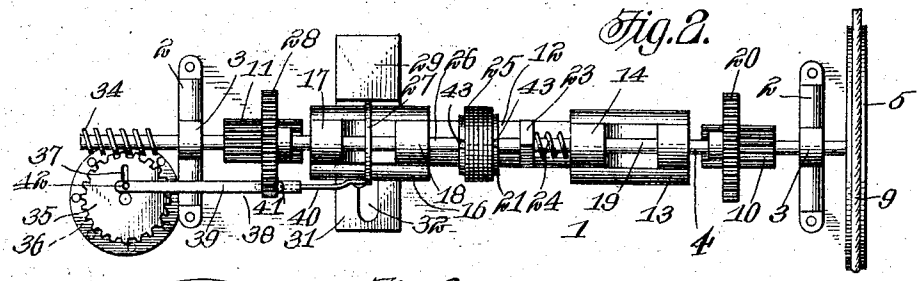


Fig. 3.

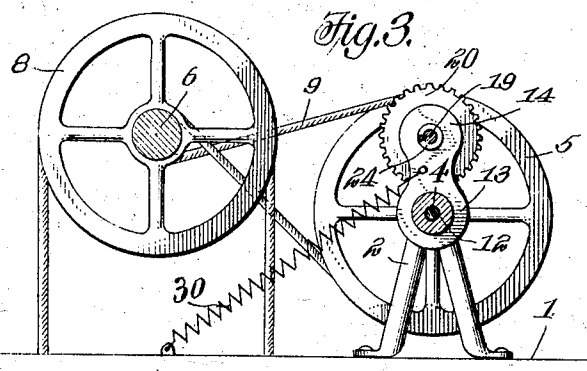
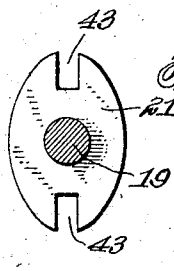


Fig. 4.



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No. 772,785. Patented October 18, 1904.

UNITED STATES PATENT OFFICE.

EDWARD CLARKE, OF DUNKIRK, NEW YORK.

MACHINE FOR GRINDING THE EDGES OF LENSES.

SPECIFICATION forming part of Letters Patent No. 772,785, dated October 18, 1904.

Application filed April 18, 1904. Serial No. 203,780. (No model.)

To all whom it may concern:

Be it known that I, EDWARD CLARKE, a citizen of the United States, residing at Dunkirk, in the county of Chautauqua and State of New York, have invented certain new and useful Improvements in Machines for Grinding the Edges of Lenses; and I do declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

My invention is an improved machine for grinding the edges of lenses; and it consists in the construction, combination, and arrangement of devices hereinafter described and claimed.

In the accompanying drawings, Figure 1 is an elevation of a lens-grinding machine embodying my improvements. Fig. 2 is a top plan view of the same. Fig. 3 is a vertical sectional view of the same, taken on the plane indicated by the line *a a* of Fig. 1. Fig. 4 is a detail view of one of the lens-holders.

On a suitable base (here indicated by line 1) are mounted a pair of standards 2, which have bearings 3 at their upper ends for a shaft 4. Said shaft is provided at one end with a pulley 5. At a suitable distance from the shaft 4 is mounted the shaft 6 of a grindstone 7. The grindstone-shaft has a power-pulley 8, whereby it may be rotated, and the grindstone-shaft is connected to the pulley 5 of the shaft 4 by the crossed belt 9. Hence the grindstone-shaft and the shaft 4 are rotated simultaneously in opposite directions, the shaft 4 being rotated very slowly.

On the shaft 4, near the ends thereof, are long pinions 10 and 11. Also mounted on the said shaft for oscillating movement and for longitudinal movement between the pinions is a carriage 12. The same has an arm 13 at one end provided with a bearing 14 and has at its opposite end a pair of arms 15 16, provided, respectively, with bearings 17 18.

A shaft 19 is journaled in the bearing 14, has at its outer end a spur-gear 20, which engages the long pinion 10, and is provided at its inner end with a lens-holder 21 of suitable size and shape. The inner portion of the said shaft is screw-threaded for a suitable distance, as at 22, and on the said threaded portion of said shaft is an adjusting-nut 23. A spring 24, which is here shown as a coiled extensile spring, is placed on the said shaft and bears between the bearing 14 and the adjusting-nut. By means of the latter the tension of the spring may be varied, and the function of the spring is to move the shaft 19 longitudinally in one direction to press the lens between the lens-holder 21 and a corresponding lens-holder 25 on the inner end of a shaft 26, which is mounted in the bearings 17 18. Said shaft is provided with a pattern-cam 27 of the required size and shape, which pattern-cam is between the bearings 17 18, and at the outer end of said shaft 26 is a spur-gear 28, which corresponds in size with the gear 20. The long pinions 10 11 are both also of the same size, and hence it will be understood that when the shaft 4 is turned by the means hereinbefore described the shafts 19 26 will be simultaneously rotated and both at the same rate of speed, so as to cause the work clamped between the lens-holders to be revolved with its edge against the grindstone. Any suitable number of lenses may be ground simultaneously, as will be understood.

A pattern-guide standard 29 is mounted on the base 1 and bears against the pattern-cam 27 and coacts with the latter and with a spring 30, attached to one of the arms of the carriage, to impart oscillating motion to the latter and cause the lens to be ground to the proper size and shape. The standard 29 has a foot 31, which is provided with an adjusting-slot 32. A set-screw 33 in said slot and which secures the standard on the base enables the pattern-guide standard to be adjusted as may be required by the size and shape of the pattern-cam.

At the end of shaft 4 opposite the pulley 5 is a worm 34. The same is engaged by a worm-gear 35, which is mounted for rotation on the upper end of a standard or bearing 36, which is secured on the base 1. Said worm-gear has a radial adjusting-slot 37. An extensible pitman 38, which is here shown as comprising telescopically-related sections 39 40, clamped together by a set-screw 41, connects the carriage to the worm-gear, the pin

42 at the outer end of the said extensible pitman being adjustable in the slot 37 of the worm-gear, so as to vary the stroke of the pitman and the corresponding longitudinal movement of the carriage, as may be required by the number of lenses which are being ground at the same time and by the width of the grindstone. The lens-holders are provided at their opposite ends with notches 43, which enable the lenses being ground to be dotted with ink on their meridial axes and placed with the dots in the centers of the said notches 43, thereby enabling the lenses to be correctly placed in the lens-holders with respect to the pattern-cam.

From the foregoing description, taken in connection with the accompanying drawings, the construction and operation of the invention will be readily understood without requiring a more extended explanation.

Various changes in the form, proportion, and the minor details of construction may be resorted to without departing from the principle or sacrificing any of the advantages of this invention.

Having thus fully described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. In a machine of the class described, the combination of a revoluble grinding element, a shaft driven thereby and having long pinions and a worm, a carriage movable longitudinally and pivoted on the shaft, a gear engaged and rotated by the worm, a pitman connecting said gear to the carriage to reciprocate the latter, alined shafts carried by the carriage and having work-holders at their inner ends, gears on said shafts engaging the long pinions, a pattern-cam on one of said alined shafts, and means coacting with the pattern-cam to impart oscillating motion to the carriage.

2. In a machine of the class described, the combination of a revoluble grinding element, a shaft driven thereby and having long pinions and a worm, a carriage movable longitudinally and pivoted on the shaft, a gear engaged and rotated by the worm, a pitman connecting said gear to the carriage to reciprocate the latter, alined shafts carried by the carriage and having work-holders at their inner ends, gears on said shafts engaging the long pinions, a pattern-cam on one of said alined shafts, a standard engaged by the said pattern-cam, and a spring connected to the carriage and coacting with the pattern-cam and standard to impart oscillating motion to the carriage.

3. In a machine of the class described, the combination of a revoluble grinding element, a shaft driven thereby in a reverse direction and having a gear, a carriage pivotally mounted on said shaft for angular movement toward and from the grinding element, and a revoluble work-holder mounted in the carriage and having a gear engaging that of said shaft, whereby the opposing surfaces of the grinding element and the work are driven in the same direction.

4. In a machine of the class described, the combination of a revoluble grinding element, a shaft driven thereby in a reverse direction and having a gear, a carriage pivotally mounted on said shaft for angular movement toward and from the grinding element, a revoluble work-holder mounted in the carriage and having a gear engaging that of said shaft, whereby the opposing surfaces on the grinding element and the work are driven in the same direction, and means to impart oscillating motion to the carriage.

In testimony whereof I have hereunto set my hand in presence of two subscribing witnesses.

EDWARD CLARKE.

Witnesses:
T. P. HEFFERNAN,
ISABEL M. CLIFFORD.