

No. 656,685.

Patented Aug. 28, 1900.

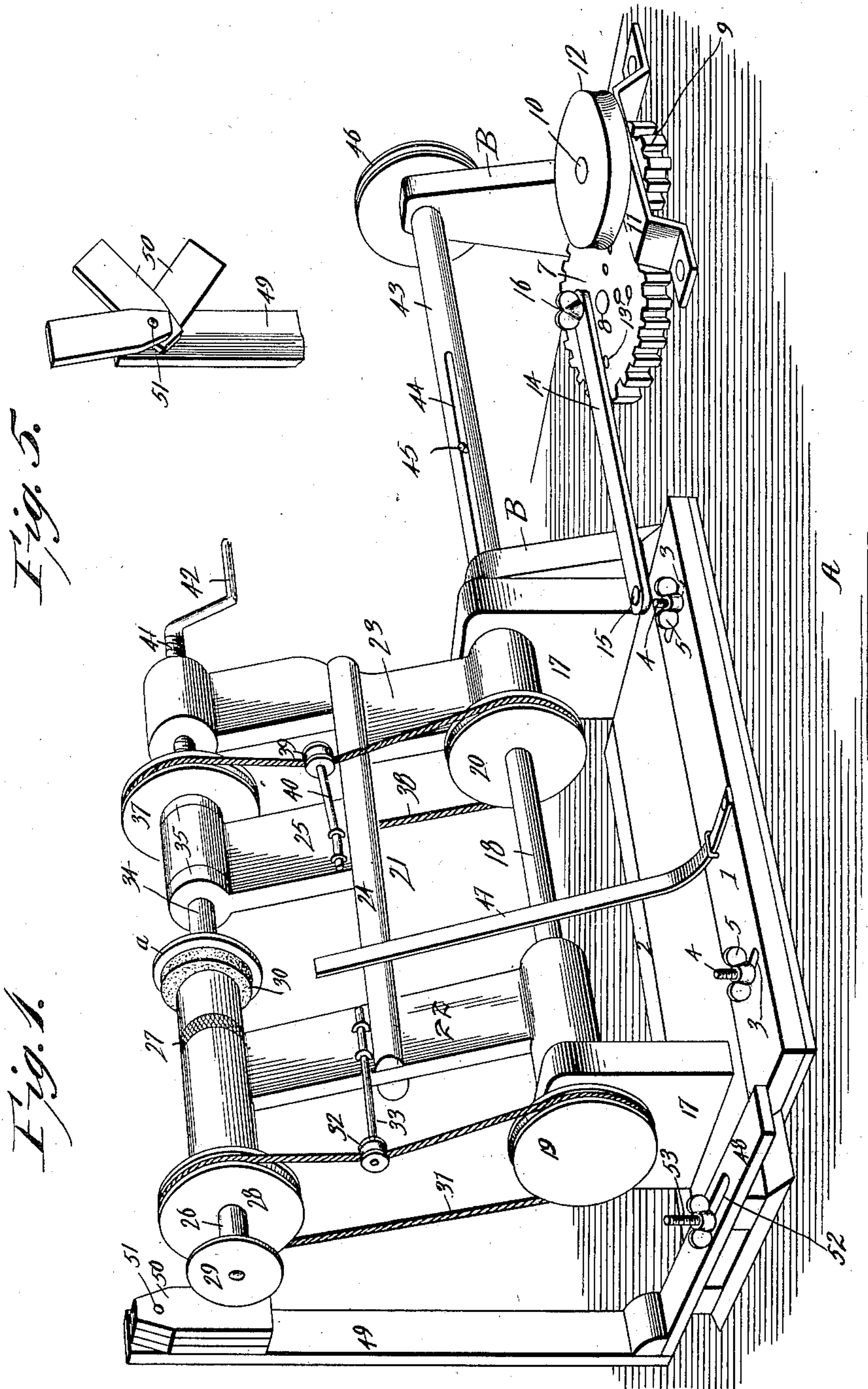
L. WILHELM.

MACHINE FOR GRINDING EDGES OF LENSES.

(Application filed Apr. 17, 1900.)

(No Model.)

2 Sheets—Sheet 1.



Witnesses

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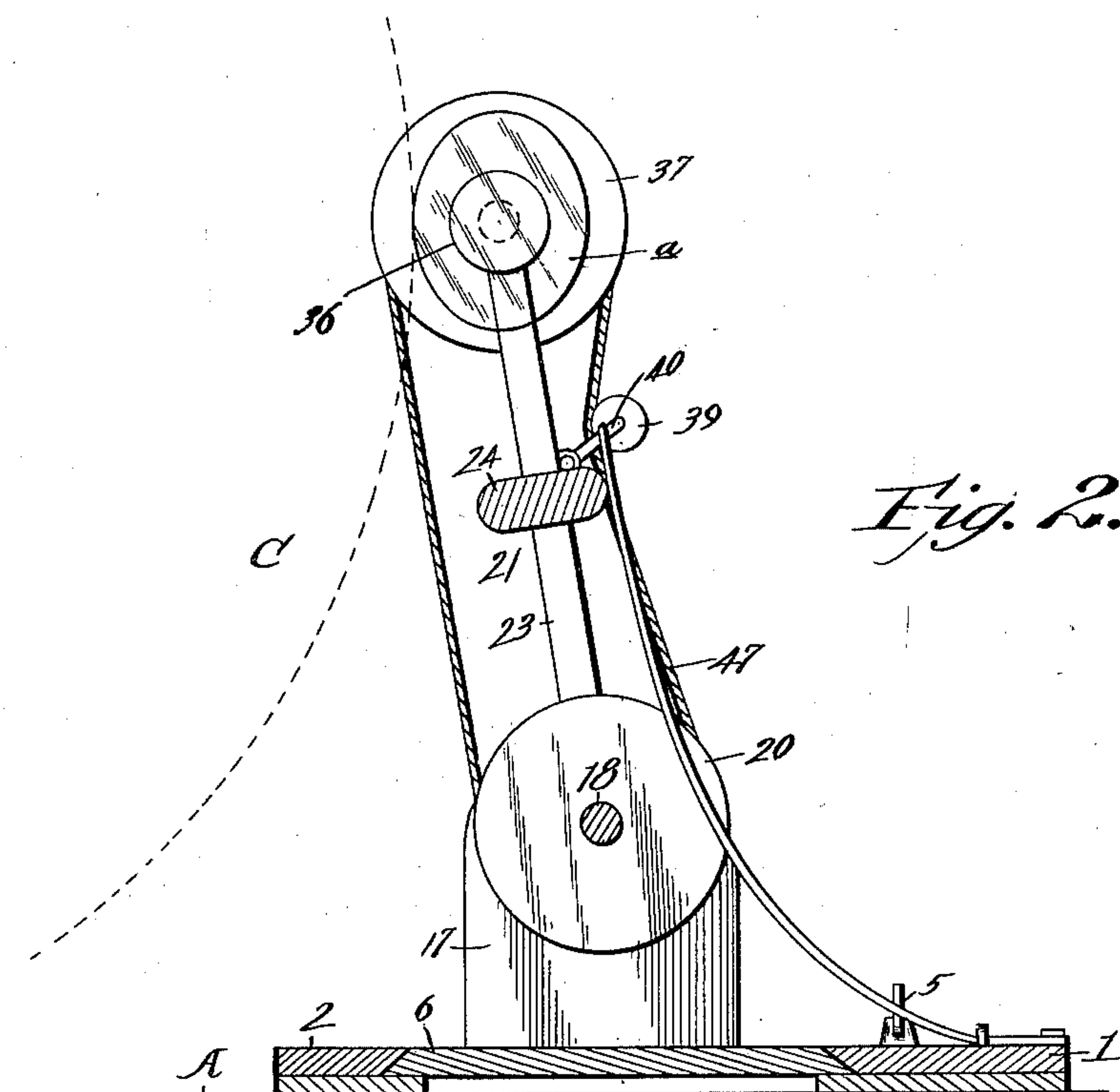


Fig. 2.

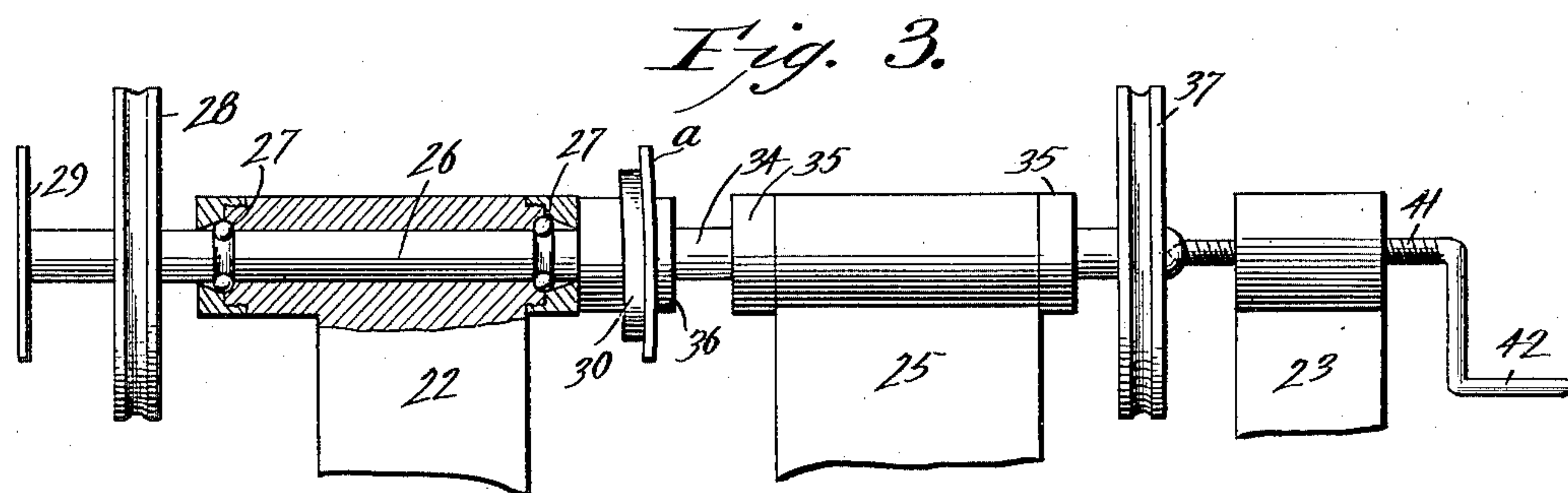


Fig. 3.

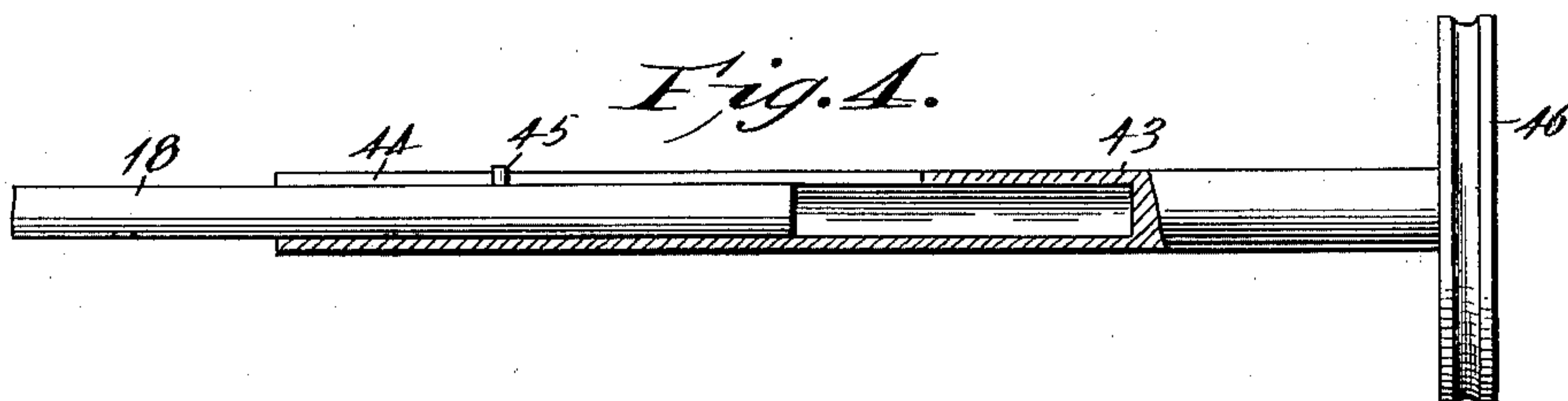


Fig. 4.

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# UNITED STATES PATENT OFFICE.

LOUIS WILHELM, OF SOUTHBRIDGE, MASSACHUSETTS.

## MACHINE FOR GRINDING EDGES OF LENSES.

SPECIFICATION forming part of Letters Patent No. 656,685, dated August 28, 1900.

Application filed April 17, 1900. Serial No. 13,264. (No model.)

*To all whom it may concern:*

Be it known that I, LOUIS WILHELM, a subject of the German Emperor, residing at Southbridge, in the county of Worcester and State of Massachusetts, have invented a new and useful Machine for Grinding the Edges of Lenses, of which the following is a specification.

My invention is an improved machine for grinding the edges of lenses of spectacles; and it consists in the peculiar construction and combination of devices hereinafter fully set forth, and pointed out in the claims.

In the accompanying drawings, Figure 1 is a perspective view of a lens-grinding machine constructed in accordance with my invention. Fig. 2 is a vertical transverse sectional view of the same. Fig. 3 is a detail elevation, partly in section. Fig. 4 is a detail view, partly in section, of the telescoping counter-shaft. Fig. 5 is a detail perspective view of the gage.

On a bed A are secured a pair of plates 1 2, the plate 1 being provided with transversely-disposed slots 3, in which operate bolts 4, having thumb-nuts 5, said plate 1 being thereby laterally adjustable and said bolts and thumb-nuts serving to secure the same on the bed at any desired adjustment. The opposing sides of the plates 1 2 are beveled, and between the same is fitted a sliding base-plate 6, the said plates 1 2 forming supports and guides for said sliding base-plate 6.

A gear-wheel 7 is mounted on a spindle 8, which projects vertically from the upper side of the bed A and is engaged by a pinion 9 on a vertical shaft 10, which is carried in bearings formed in said bed A and in a bracket 11, which is bolted on said bed. To the upper end of the said shaft is keyed or otherwise secured a sheave or pulley 12, which is rotated by an endless belt (not shown) from a suitable source of power, and hence the wheel 7 is rotated through the pinion 9. Said wheel 7 is provided with a series of openings 13, which are disposed at various distances from the center thereof, and a pitman 14, which has its inner end pivotally connected to the sliding base-plate 6, as at 15, has its outer end secured to either of said openings 13 by a thumb-screw 16. It will be understood that said wheel 7 and said pitman serve

to impart reciprocatory motion to the plate 6 and that the stroke of the latter may be lengthened or shortened by securing the thumb-screw 15 in an appropriate adjusting-opening 13.

The plate 6 is provided on its upper side with a pair of ears or standards 17, which are provided with bearings for a shaft 18. Said shaft carries a pair of pulleys 19 20, and on the said shaft is pivoted a swinging head 21, which comprises the arms 22 23, the connecting cross-piece 24, and an arm 25, which projects from the outer side of said cross-piece at a suitable distance from the arm 22. In the outer end of the arm 22 is journaled a shaft 26, and ball-bearings are preferably provided for said shaft, as at 27. Said shaft has a pulley 28 secured thereto near its outer end, and a cam 29 is secured to the outer end of said shaft, said cam being elliptical in form and conforming to the shape of the lenses which the machine is to be employed in grinding. It will be understood that said cam may be of other than elliptical form, this being determined by the shape of the work. To the inner end of the shaft 26 is secured a friction-cushion 30, which is preferably made of cork, india-rubber, or felt, but which may be of any suitable elastic material, and the face of which is convex and adapted to fit the concave sides of a lens, the latter being indicated in the drawings by the letter *a*. The pulley 28 is connected to the pulley 19 by an endless cord 31, and the tension of said cord on said pulleys is maintained by a roller-sheave 32, which is carried on a spring-rod 33, the latter being secured to the arm 22, as shown.

A shaft 34, which alines with the shaft 26, is journaled in ball-bearings 35, with which the outer end of the arm 25 is provided. Said shaft has at its inner end a friction disk or head 36, which is adapted to engage one side of the lens, and at the outer end of said shaft is a pulley 37. Said pulley is connected to the pulley 20 by an endless cord 38, the tension of which is at all times maintained on said pulleys by a sheave-roller 39, which is carried by a spring-rod 40, the latter being secured to the arm 25 or any other appropriate part of the head 21. The friction-head 36 is also preferably made of cork, india-rub-



ber, or felt, but may be made of any other suitable elastic material, as leather or the like, and said head 36 is adapted to be clamped against one side of the lens, so that the latter will be firmly secured between the friction-heads 30 36 by a screw-shaft 41, which is disposed in line with the center of the shaft 34, operates in a threaded opening in the outer end of the arm 23 of the swinging head 21, and is provided at its outer end with a suitable crank or other means 42, whereby it may be turned. The inner end of said screw-shaft, as shown in Fig. 3, is stepped in the outer end of the shaft 34.

The bed A is provided with a pair of standards B, in which is journaled a hollow shaft 43. The outer end of the shaft 18 extends into said hollow shaft 43, and the latter is provided with an elongated slot 44, in which operates a stud 45, that projects from the shaft 18. By this arrangement the shaft 18 telescopes in the hollow shaft 43 and is rotated by the latter, said shaft 43 being provided with a pulley 46, driven by an endless cord or belt (not shown) from a suitable source of power, and this telescoping connection permits of the reciprocating motion of the plate 6 and the swinging head carried thereby, as will be understood.

In operation my improved lens-grinding machine is arranged opposite the grinding face or periphery of a grindstone, the latter being indicated by the curved dotted line lettered C in Fig. 2 of the drawings, and it will be understood that rotatory motion being communicated to the lens *a* through the connections hereinbefore described and said lens bearing against the grindstone and the latter being also rotated the edges of the lens will be ground.

Inasmuch as the head 21, which carries the lens and its rotating heads and connections, is carried by the reciprocating plate 6, the lens is moved transversely across the face of the grindstone, and hence wears the latter evenly from side to side and avoids the formation of channels in the face of the grindstone. A spring 47, which is attached to the plate 1, but which may be attached to the plate 6, if preferred, bears against the outer side of the cross-bar 24, forming a part of the swinging head, and hence maintains the latter normally in the position indicated in Figs. 1 and 2 of the drawings, with the edge of the lens in engagement with the periphery of the grindstone.

By connecting the shafts which carry the lens and rotating the same with the counter-shaft by means of endless cords and pulleys, as hereinbefore described, the cords and pulleys cause the lens to be rotated without jar or vibration, with the result that the edges thereof are much more finely ground and finished than is possible in machines in which trains of gear-wheels are employed.

On one end of the plate 6 is secured an adjustable gage comprising a base 48, a vertical

standard 49, and a series of sizer-plates 50, which are pivotally attached to the standard 49, as at 51. The thickness of each sizer-plate corresponds to the difference between two sizes of lenses. The base 48 of the gage has a slot 52. The adjusting-screw 53, which secures the gage on the end of the plate 6, works in the said slot and serves to effect the initial adjustment of the gage and of the lens-grinding machine, the sizer-plates being all turned on the standard 49 and the cam 29 being in engagement with the outermost sizer-plate when the machine is adjusted for grinding lenses of the smallest size. In order to adapt the machine to grind lenses of a larger size, this may be effected without altering the adjustment of the gage on the plate 6 by merely turning one or more of the sizer-plates to one side, and thereby causing the cam 29 to bear against a sizer-plate which is appropriate to the size of the lenses to be ground.

Having thus described my invention, I claim—

1. In a machine for grinding lenses, the combination with a work-head having a bearing-cam, of a gage having a series of sizer-plates imposed upon each other and against which said cam is adapted to bear, substantially as described.

2. In a machine for grinding lenses, the combination with a work-head having a bearing-cam, of an adjustable gage having a series of sizer-plates imposed upon each other against which said cam is adapted to bear, substantially as described.

3. In a machine for grinding the edges of lenses and the like, the combination of a sliding base, guideways therefor, and means to impart reciprocating motion thereto, a power-shaft in bearings on the base-plate, said power-shaft having pulleys, a gage secured to the base-plate and having a standard, a swinging head pivoted on said power-shaft, shafts having their bearings in said swinging head, and provided with heads to clutch and rotate a lens, said shafts having pulleys, and one of said shafts having a cam adapted to coact with the standard, and endless cords connecting the pulleys on the respective shafts, substantially as described.

4. In a machine for grinding the edges of lenses and the like, the combination of a sliding base, guideways therefor, a revoluble element, a pitman attached to said base-plate and adjustably connected to said revoluble element, a power-shaft in bearings on the base-plate, said power-shaft having pulleys, a gage secured to the base-plate and having a standard, a swinging head pivoted on said power-shaft, shafts having their bearings in said swinging head and provided with heads to clutch and rotate a lens, said shafts having pulleys, and one of said shafts having a cam adapted to coact with the standard, and endless cords connecting the pulleys on the respective shafts, substantially as described.



5. In a machine for grinding the edges of lenses and the like, the combination of a sliding base, guideways therefor, and means to impart reciprocating motion thereto, a power-  
5 shaft in bearings on the base-plate, said power-shaft having pulleys, an adjustable gage secured to the base-plate and having a standard, a series of sizer-plates imposed upon each other and carried by said standard, a  
10 swinging head pivoted on said power-shaft, shafts having their bearings in said swinging head and provided with heads to clutch and rotate a lens, said shafts having pulleys and

one of said shafts having a cam adapted to coact with the sizer-plates on the standard, 15 and endless cords connecting the pulleys on the respective shafts, substantially as described.

In testimony that I claim the foregoing as my own I have hereto affixed my signature in 20 the presence of two witnesses.

LOUIS WILHELM.

Witnesses:

GEORGE S. POTTER,  
CLARE S. HALL.