

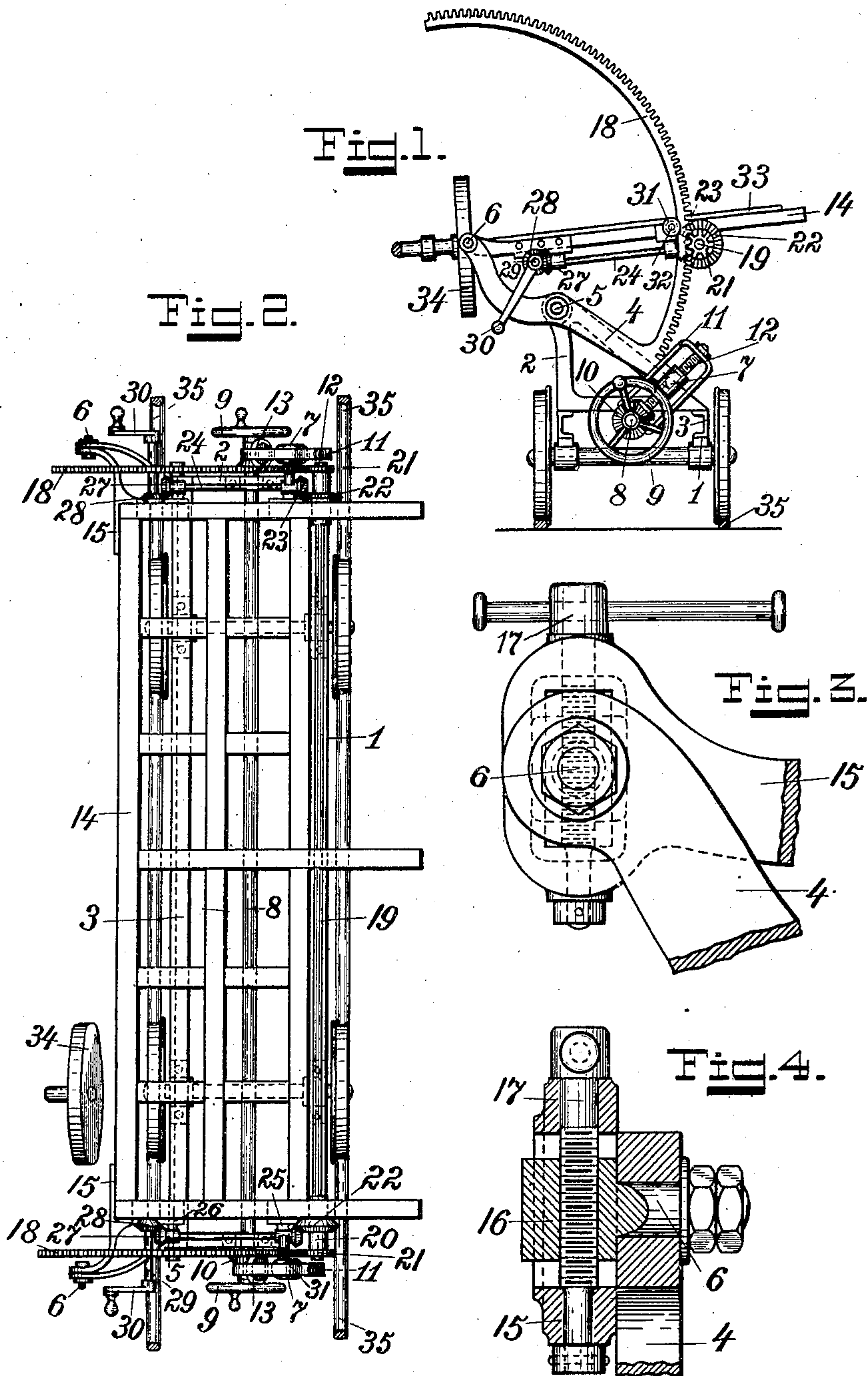
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H. LOHMANN.

MACHINE FOR GRINDING EDGES ON GLASS PLATES.

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Witnesses:  
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# UNITED STATES PATENT OFFICE.

HEINRICH LOHMANN, OF AIX-LA-CHAPELLE, GERMANY.

## MACHINE FOR GRINDING EDGES ON GLASS PLATES.

No. 862,175.

Specification of Letters Patent.

Patented Aug. 6, 1907.

Application filed April 9, 1906. Serial No. 310,711.

*To all whom it may concern:*

Be it known that I, HEINRICH LOHMANN, a subject of the King of Prussia, residing at Aix-la-Chapelle, No. 109 Lütticherstrasse, in the Kingdom of Prussia, Empire of Germany, have invented certain new and useful Improvements in Machines for Grinding Edges on Glass Plates; and I do hereby 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 present invention relates to a machine for grinding edges on glass-plates, and the object in view is to produce a machine by the aid of which glass-plates may be provided not only with straight and broken-lined edges, but also with rounded and semicircular edges, to which end the grinding-plane can be advanced to coincide with the geometrical axis of the gudgeons on which the arms of the plate-holder are fulcrumed. To facilitate the necessary manipulations the arms of the plate-holder are made vertically adjustable on said gudgeons, which are secured to the free ends of double-armed levers fulcrumed and operated to not only raise or lower the glass-plate at will, but also to advance it towards the grinding-disk or to draw it away from it.

In the accompanying drawing: Figure 1 is an end-view of the machine. Fig. 2 is a plan-view of the machine. Fig. 3 is a side view of the device for adjusting the arms of the plate-holder vertically on the gudgeons on which the latter is fulcrumed. Fig. 4 is a vertical sectional view of said adjusting device.

The frame of the machine chiefly consists of the carriage 1 and the triangular supports 2 secured to the carriage-girders 3. At the upper corner of each of said triangular supports a double-armed lever 4 is fulcrumed on a stud 5. In the shorter arm of each of said levers 4 a gudgeon 6 is revolubly mounted, whereas the longer arm thereof carries a swivel-nut 7. On the under side of the supports 2 a shaft 8 is journaled and each end thereof provided with a hand-wheel 9. Next to the outer faces of said supports conical wheels 10 are secured to said shaft 8 and between these conical wheels 10 and the hubs of said hand-wheels 9 the eyes of swinging frames 11 are arranged, within which screws 12 working in said swivel-nuts 7 are held. Upon the lower end of each of said screws a conical wheel 13 is secured which meshes with the adjacent wheel 10 seated upon the shaft 8. It is evident that on turning one of the hand-wheels 9 the shaft 8 will be rotated and simultaneously therewith the longer arms of the levers 4 are raised or lowered accordingly thus offering a means for readily adjusting the gudgeons in a downward and outward direction.

The plate-holder 14 is a frame provided with numerous subdivisions for readily sustaining large glass-plates as well as small ones. As indicated in Fig. 2, a curved arm 15 is secured to each end of the plate-holder

14 and the eye of each arm is slotted for the reception of a nut 16 forming a part of the gudgeon 6. A screw 17 is revolubly held in the eye of each arm 15, but prevented from moving longitudinally, so that on rotating the screw 17 in the one direction or the other the end of the arm 15 will be raised or lowered relatively to the gudgeon 6. This adjustment of the arms 15 relatively to the gudgeons 6 is a very important feature of the present invention and its object will be more fully explained below.

To raise or lower the off-side of the plate-holder 14 at will a curved rack 18 is provided on the longer arm of each of said levers 4 and curved to a radius struck from the center of the adjacent gudgeon 6. Below the plate-holder 14 a shaft 19 is journaled and provided at each end with a sleeve 20 on which a spur-wheel 21 and a conical wheel 22 are seated, or cast in one piece therewith. Each of said spur-wheels 21 meshes with one of said racks 18, whereas each of said conical wheels 22 meshes with a conical wheel 23 seated upon a shaft 24 journaled in the brackets 25 and 26 secured to the plate-holder 14. The ends of the shafts 24 next to the arms 15 are likewise provided with conical wheels 27 which mesh with similar wheels 28 seated upon the shafts 29 held in a suitable manner in said brackets 26 or journaled independent thereof. Each shaft 29 is provided with a crank 30 so that on turning one of these cranks both spur-wheels 21 will travel on their racks and raise or lower the off-side of the plate-holder 14 according to the direction the cranks 30 are turned. The raising and lowering of the plate-holder will be executed without bending and twisting it, since the shaft 19 compels the spur-wheels 21 to work in unison. To further safeguard the faultless working of the machine, double-flanged guide-rollers 31 are provided, which rotate on studs 32 supported by the brackets 25, guide said racks 18 between their flanges and thus prevent that spur-wheels and racks are not thrown out of mesh. If now a glass-plate 33 be secured in any suitable manner to the plate-holder placed at right angles to the rotating grinding-disk 34, and then the plate-holder be swung gradually upwards and afterwards to about the same extent below the original position of the plate-holder while the carriage is moved back and forth over the tracks 35 the upper as well as the lower corners of the rough edge of the glass-plate will be broken. These operations are necessary to prevent the corners from chipping when the edge of the plate is ground to form right angles with both surfaces of the glass-plate. To obtain a straight edge the glass-plate is next placed at right angles to the grinding-disk 34 and then the rough part of the edge lying between the chamfered corners brought into contact with the grinding-disk by manipulating the levers 4. As in doing so, the right angle between grinding-face and the glass-plate is altered, it must be reestablished



by raising or lowering the off-side of the plate-holder until a straight and right-angled edge has been formed. If, however, instead of an edge forming right angles with both surfaces of the glass-plate an edge is required which forms an obtuse angle with the upper surface of the glass-plate and an acute angle with the lower surface thereof; and if further it is desired that this straight edge is to be formed during the grinding operation, then not only the lower surface of the glass-plate must coincide with the imaginary line connecting the center lines of the gudgeons 6 but also the grinding plane of the grinding-disk must coincide therewith, which can be done by adjusting the nuts 16 by means of the screws 17 until the lower surface of the glass-plate has attained the desired position, and then gradually approach the grinding-disk 34 until its grinding-plane has reached said imaginary line. After both operations have been executed it is only necessary to gradually raise the off-end of the plate-holder by turning one of the cranks 30 until the desired obtuse and acute angles have been reached. It is evident, that to form edges consisting of a broken line it would be only necessary to first form an edge which meets both surfaces of the glass-plate at right angles and afterwards draw the grinding-disk 34 for a suitable distance back and then gradually break the upper corner by raising the plate-holder. If instead of a straight edge a rounded edge, either one-sided or symmetrical, has to be formed then the glass-plate must be pushed beyond the imaginary line 6—6 to suit the radius to which the curvature of the rounded edge is to be ground, whereby the grinding-disk must be drawn back to the desired extent. If it is desired to let the curvature start from the under surface of the glass-plate then the latter must be adjusted to let its lower surface pass through said imaginary line 6—6 and subsequently the plate-holder gradually raised until the curved edge is formed. If it is desirable to let the curvature start from the upper surface of the glass-plate, the plate-holder is lowered until the imaginary line 6—6 coincides with said upper surface; whereupon the plate-holder is gradually lowered until the rounded edge is formed. If finally the rounded edge is to be arranged symmetrically to the central plane of the glass-plate, the latter is adjusted until said central plane coincides with said imaginary line 6—6. After this has been accomplished the grinding-disk is gradually advanced until the right radius is obtained, and simultaneously therewith the plate-holder is raised or lowered by means of one or both cranks 30. The limit of symmetrically rounded edges in the one direction would be a semicircular edge, which to obtain the grinding plane must approach the imaginary line 6—6 to a distance equal to half the thickness of the glass-plate, after which the plate-holder is raised until the upper surface of the glass-plate all but touches the

grinding-plane. After one half of the edge has been finished the glass-plate is turned over and the other half of the edge finished in the same manner, which operation becomes necessary, since the downward motion of the plate-holder is limited by the racks 18.

The grinding operations explained above are in the first place made possible by the fact that the glass-plate can be passed between the gudgeons supporting the plate-holder without coming into contact with the same, and secondly for the reason that the plate-holder can be raised or lowered relatively to said gudgeons.

I claim:—

1. A machine for grinding edges on glass-plates comprising a carriage, supports mounted thereon, double-armed levers fulcrumed to said supports, a gudgeon held in the upper end of each of said levers, a plate-holder fulcrumed on said gudgeons to leave the space sidewise of the adjacent longitudinal edge of said plate-holder and between said gudgeons unobstructed, a curved rack carried by the lower arm of each of said double-armed levers, means carried by said plate-holder to cooperate with said racks for swinging said plate-holder on said gudgeons, and means for simultaneously tilting said levers.
2. A machine for grinding edges on glass-plates comprising a carriage, supports mounted on said carriage, a double-armed lever with unequal arms fulcrumed to each of said supports, a gudgeon revolvably held in the eye of the shorter arm of each of said levers, a plate-holder, outwardly curved arms secured to the ends of said plate-holder to leave the space between said gudgeons unobstructed and vertically adjustably connected with said gudgeons, a rack carried by the longer arm of each of said double-armed levers, means carried by said plate-holder and cooperating with said racks for swinging said plate-holder on said gudgeons, and means for simultaneously operating said levers and the plate-holder carried thereby.
3. In a machine for grinding edges on glass-plates the means for adjusting the plate-holder vertically on the gudgeons carrying it, comprising in combination double-armed levers with unequal arms, gudgeons rotatably held in the eyes of the shorter arms of said levers, a nut formed on each of said gudgeons, an arm attached to each end of said plate-holder and provided with a guide-slot for the reception of one of said nuts, and an adjusting-screw seated in the free end of each of said plate-holder arms and cooperating with the nut sliding in the guide-slot of the same plate-holder arm.
4. In a machine for grinding edges on glass-plates the combination with supports secured to its carriage, of a shaft, hand-wheels placed on both ends of said shaft, conical wheels placed on said shaft next to the outer faces of said supports, a swinging frame placed between each of said hand-wheels and the adjacent conical wheel seated on said shaft, a screw in each of said swinging frames, a conical wheel secured to each of said screws and meshing with the adjacent conical wheel, seated on said shaft, a double-armed lever fulcrumed on each of said supports, and a swivel-nut on each of said levers cooperating with said screws.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

HEINRICH LOHMANN.

Witnesses:

WILLIAM J. REUTERS,  
HENRY QUADFLIEG.