(No Model.)

A. KRIÉGER.

MACHINERY FOR BEVELING GLASS.

No. 262,954. Patented Aug. 22, 1882.

FIG. 2.

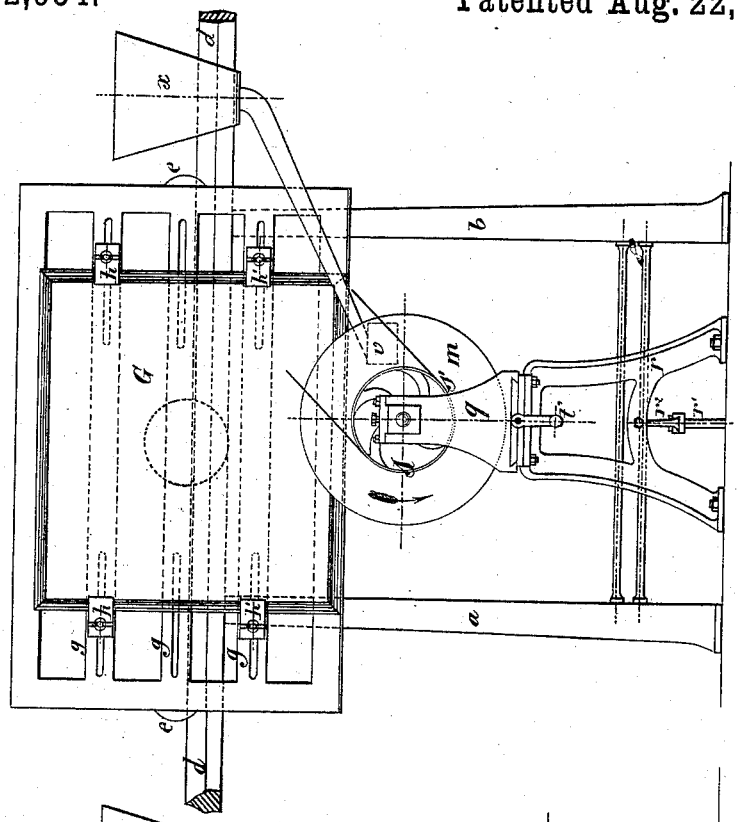
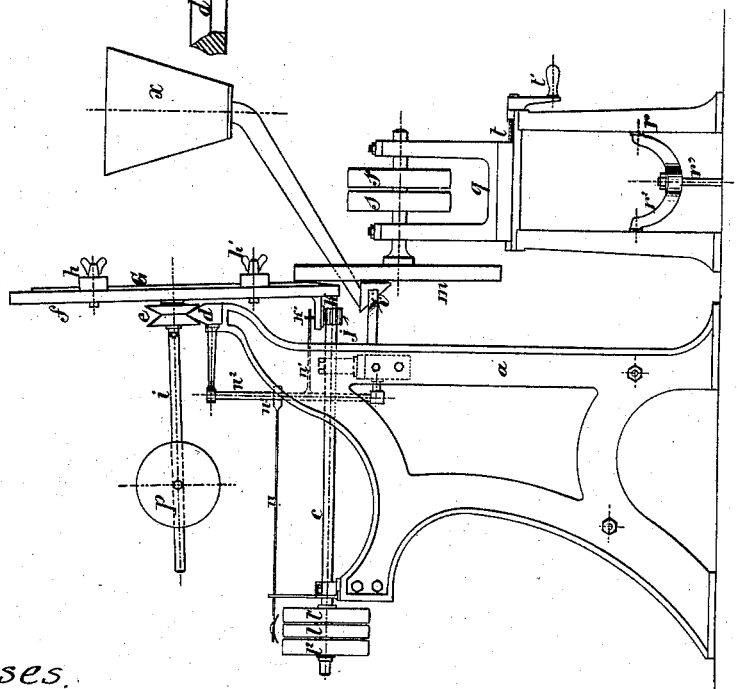


FIG. 1.



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UNITED STATES PATENT OFFICE.

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MACHINERY FOR BEVELING GLASS.

SPECIFICATION forming part of Letters Patent No. 262,954, dated August 22, 1882.

Application filed May 5, 1882. (No model.) Patented in France September 16, 1876, No. 114,585; in Belgium January 17, 1877, No. 41,298, and in England September 29, 1880, No. 3,947.

To all whom it may concern:

Be it known that I, ALPHONSE KRIÉGER, machinist, of Paris, in the Republic of France, have invented a new or Improved Machine or Apparatus for Beveling Glass, (for which I have received Letters Patent of France for fifteen years, dated September, 16, 1876, No. 114,585; of Belgium for fifteen years, dated January 17, 1877, No. 41,298, and of England for fourteen years, dated September 29, 1880, No. 3,947;) and I do hereby declare that the following is a full and exact description thereof, reference being had to the accompanying drawings.

Heretofore glass has generally been beveled by hand, or if attempts have been made to do so by machinery they have all failed. The chief cause of these failures has been the rigidity always given to the glass. Thus, for example, in one of the best of these machines the glasses were cemented side by side upon a heavy horizontal bench, which, receiving a slow to-and-fro movement, presented them successively to the grinding action of one or more small grinders. The invariability of the glasses and the relative fixity of the grinders produced bevels proportional to the thickness of each of the glasses, and which were deficient in uniformity and sharpness of the lines.

The machinery or apparatus forming the subject of the present invention is based upon a different principle and the results are quite different, the work being superior to that done by hand and the production much greater than usual.

The machinery or apparatus is of the following character:

A fixed frame carries the mechanical parts suitable for giving a movement of translation to the glass to be beveled, in order to present it slowly to the grinding-wheel which is to form the bevel. The glass is mounted without cementing upon a frame which is carried by rollers running on a guide-bar, and by the action of a counter-weight the said frame inclines the glass sufficiently to present it to the grinding-wheel at the angle required for the size of the bevel. The glass is thus mounted at the extremity of a sort of lever resting by the rollers of the frame upon the guide-bar, and having at its other end a counter-weight which forces it to lean over in order to present its sides for beveling. The inclination of the glass and its contact with the grinder are thus obtained simply by the action of the counter-weight, which replaces the hand of the workman who would present the glass to the grinder. The glass is held upon the frame by movable clamps, which replace the ordinary method of cementing. By this means it is easy to mount the glass, to change its position, and to replace it when the beveling is effected.

The drawings hereto annexed illustrate one example of machine constructed in accordance with this invention; but other arrangements and combinations may be devised without departing therefrom.

The machine represented in elevation and side view in Figures 1 and 2, respectively, is for the beveling of glasses of rectilinear contour. The support is formed of two cast-iron frames, *a* and *b*, suitably braced and stayed together, carrying behind them the driving-shaft *c* and in front and at their upper part the guide-bar *d*, which carries the frame *f*. The guide-bar *d* is of a length proportioned to the length and traverse of the glass. It is of triangular section at the part where the two friction-rollers *e* of the frame *f* roll to and fro on it. These rollers have a groove corresponding to the shape of the guide-bar, but formed at a much more open angle to allow them the greatest freedom both in front and behind. The section of the acting part of the guide-bar and that of the grooves of the rollers may be curved, round, or otherwise, provided that they are both arranged so as to allow the necessary play to the frame. The frame *f* is of wood or other suitable material, with any suitable number of strengthening cross-pieces, *g g g*, which serve also to receive the slots for the wooden cramps *h*, secured by wing-nuts, as shown. To the middle cross-piece is fixed the axis or bar *i*, carrying the counter-weight *p*, which is held in place by a tightening-screw.

The frame carries at its lower part a rack, *k*, which follows it in its deviations from the vertical position, and remains always in gear

with the teeth of the pinion *j*, keyed on the end of the driving-shaft *c*. This shaft carries the three pulleys *l l' l²*, two of which, *l' l²*, are loose, and the other or middle one is fastened on the shaft. The driving-strap is brought from one or other of the pulleys, *l' l²*, onto the fixed pulley *l*, by the bar *n*, which is caused to slide by the rack *k* at the end of its stroke by means of a stop, *k'*, which acts upon the arm *n'*. This arm is forged with the rod *n²*, to which is forged or fixed a second arm, *n³*, which causes the bar *n* to slide and to shift the straps on the corresponding pulleys.

In front of the frames *a b* of the machine is placed the grinding wheel or plate *m*, mounted on a head-stock, *g*, carried by a small frame, *r*, fixed to the ground. The axis of the grinding-wheel *m* receives the fast and loose pulleys *s* and *s'*. The head-stock is moved to or from the glass by the screw *t* with a crank-handle, *t'*. One condition, the importance of which will be better appreciated after the action of the machine has been explained, is that in order to obtain the best effect from the grinding-wheel the latter should be presented somewhat obliquely to the plane of the glass, so that this grinding-wheel, which turns in the direction of the arrow only, comes in contact with the glass at the point where the grinding is being effected, so that it shall not again touch the part which has been beveled. In order to give this obliquity and to alter it simply and quickly, the frame *r* is adapted to be turned round more or less on the bolt *r'*, which fastens the cross-bar *r²* to the ground. In front of the grinding-wheel is fixed to the frames *a b* a small funnel, *v*, through which the grinding material is delivered to the grinding-wheel through the hopper *x*, placed at the side of the machine.

Action of the machine.—The glass G being fixed by the clamps *h h*, without any previous cementing, to the frame *f*, the counterbalance-weight *p* is adjusted to the place required for suitably inclining the glass and pressing it against the grinding wheel or plate *m*. This preparative operation is effected in a very short time, and when completed the driving-shaft *c* and the grinding-wheel *m* are set in motion. The glass moves slowly to and fro longitudinally, while the revolving cast-iron grinding-plate rough-grinds the bevel with grit approximately to the required dimensions. A grinding-stone is then substituted for the cast-iron plate, whereby the bevel is smoothed, and finally the grinding-stone is replaced by a wooden grinding-disk covered with felt, which finishes and polishes the bevel.

Instead of replacing the cast-iron plate with the grinding-stone and the latter by the felt-covered wooden disk on the same machine, two similar machines may be employed, differing from each other only in the grinding-instrument. Thus one machine may be furnished with the cast-iron grinder and the other with the gritstone-grinder and the felted wood polisher. Besides economy of time, this division of the work possesses the great advantage of completely isolating the polishing from all contact with the grit coming from the hopper.

It will be understood from the above description that the counter-weight *p* acts in the general working of the machine exactly the same as the hand of the workman when presenting the glass to the grinder, for there is no alteration in the work of beveling by this machine, except that instead of a to-and-fro movement of the grinder or polisher a circular motion is given to the grit-grinder and to the felted wood polisher; but otherwise the shaping of the bevel is exactly the same as that now in use.

The action of the counter-weight may be utilized in other ways. For example, it may be made to act upon the beveling-tool instead of upon the glass, but in any case so as to obtain a kind of elastic contact between such tool and the glass, instead of the rigid one obtained in machines heretofore tried.

Instead of giving to the glass a rectilinear reciprocating motion, I could, by an analogous arrangement and the action of the counter-weight, give to this glass a continuous circular movement, to produce thus round, oval, or elliptical glasses. I could also submit the grinder to the action of the said counter-weight.

Having now described the nature of the said invention and the manner in which the same is to or may be carried into effect, I would have it understood that the forms, materials, and dimensions of the parts comprising the machine hereinbefore described, and represented in the drawings, for the mechanical beveling of glass may be varied without departing from the invention; but

What is claimed as the invention to be secured by the hereinbefore-in-part-recited Letters Patent is—

The combination, with a supporting-frame and rail *d*, of the traveling frame *f*, rollers *e*, adjustable counter-weight *i p*, clamps *h*, rack *k*, pinion *j*, and self-acting reversing apparatus *k' n n' n² n³*, all arranged substantially as herein shown and described.

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