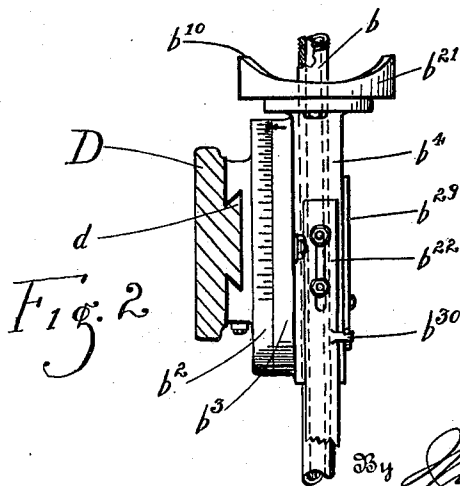
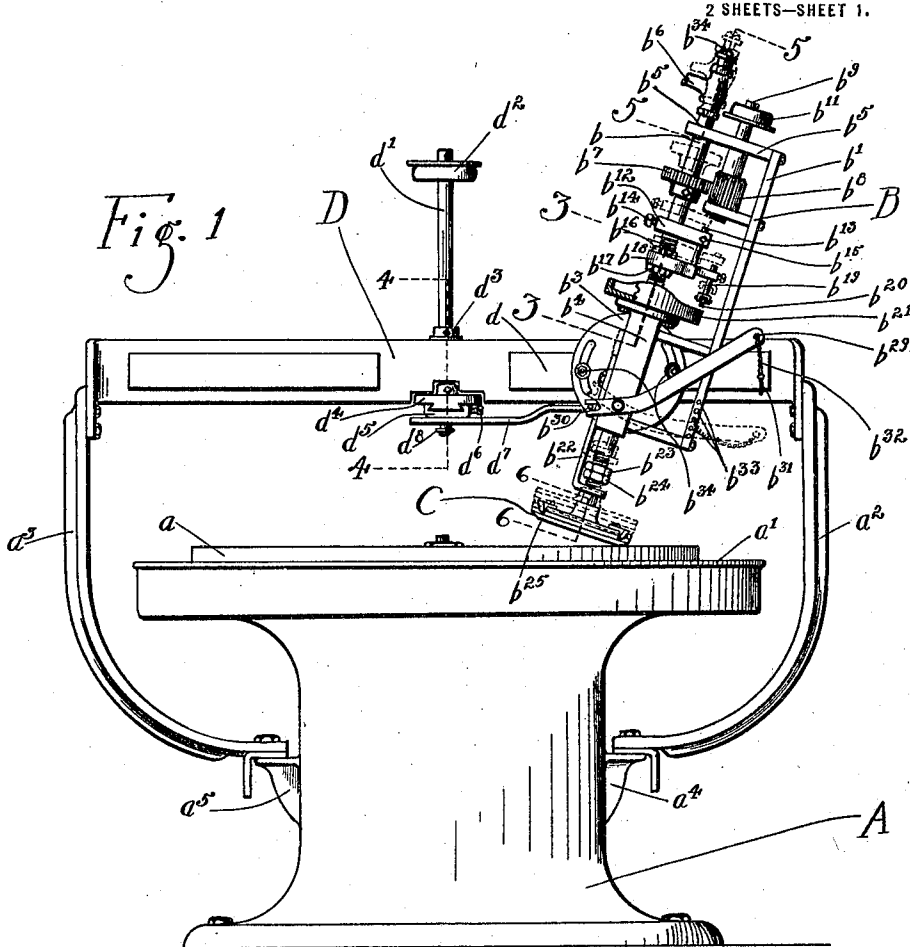


W. J. HERSCHEDE AND W. EBERHARDT.
MACHINE FOR GRINDING GLASS PLATES.
APPLICATION FILED MAY 18, 1920.

1,401,698.

Patented Dec. 27, 1921.

2 SHEETS—SHEET 1.



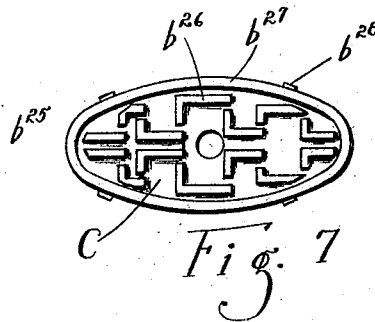
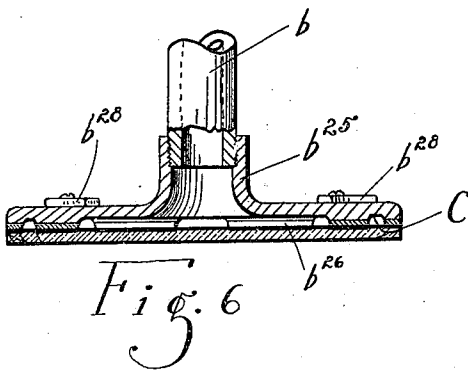
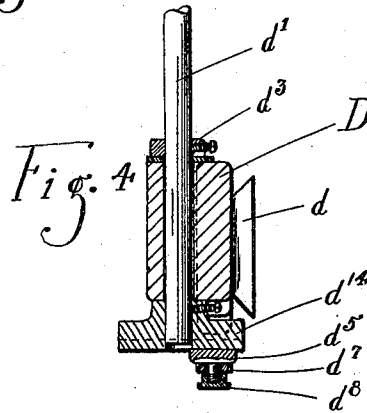
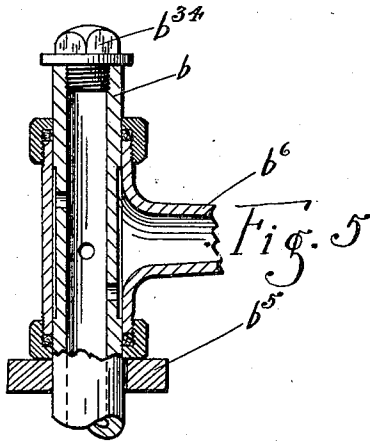
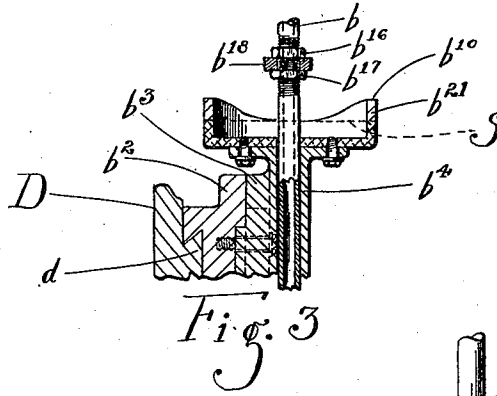
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Attorney

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2 SHEETS—SHEET 2.



Inventors
Walter J. Herschede
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UNITED STATES PATENT OFFICE.

WALTER J. HERSCHEDE AND WALTER EBERHARDT, OF CINCINNATI, OHIO.

MACHINE FOR GRINDING GLASS PLATES.

1,401,698.

Specification of Letters Patent.

Patented Dec. 27, 1921.

Application filed May 18, 1920. Serial No. 332,282.

To all whom it may concern:

Be it known that we, WALTER J. HERSCHEDE and WALTER EBERHARDT, citizens of the United States of America, and residents of Cincinnati, in the county of Hamilton and State of Ohio, have invented a new and useful Improvement in a Machine for Grinding Glass Plates, of which the following is a specification.

10 An object of our invention is to provide a mechanical device that will automatically grind glass plates.

Another object of our invention is to provide a device for the purpose stated that will operate faster, and more accurately than devices used heretofore.

15 Another object is to provide a device that will bevel oval pieces of glass accurately and that will not leave waves, in the bevel.

20 Another object is to prevent grooving of the grindstone.

These and other objects are attained by the means described herein and disclosed in the accompanying drawing in which:

25 Figure 1 is a front elevation of a device embodying our invention.

Fig. 2 is an enlarged fragmental side view of a plate carriage, forming a detail of our invention.

30 Fig. 3 is an enlarged sectional view on line 3—3 of Fig. 1.

Fig. 4 is an enlarged sectional view on line 4—4 of Fig. 1.

Fig. 5 is an enlarged sectional view on line 5—5 of Fig. 1.

35 Fig. 6 is an enlarged sectional view on line 6—6 of Fig. 1.

Fig. 7 is an inverted plan view, on a reduced scale, of a plate holder for oval glass.

40 Our invention comprises a base A, upon which is revolved a grindstone *a*. The plate carriage B is supported above the base, and is slidably mounted upon the support bar D. The shaft *b* of the plate carriage is adapted to be revolved, at an angle to the grindstone *a*, whereby bevels of various angles may be ground upon the plate of glass C held upon the plate carriage.

45 The base A has a horizontal upper surface *a'* upon which the grindstone *a* is revolved. The brackets *a*² and *a*³ are mounted upon the lugs *a*⁴ and *a*⁵ respectively formed on the base. The brackets support the bar D above the grindstone *a*.

50 The plate carriage B comprises a frame *b'* supporting the hollow shaft *b*. The car-

riage is slidably mounted upon the dovetailed horizontal block *d* formed on the bar D. The means whereby the carriage is attached to the block comprise the disk *b*² having a dovetailed way formed in it, and the disk *b*³ revolubly mounted upon disk *b*². A guide sleeve *b*⁴ is formed integral with the disk *b*³. The shaft *b* extends through the sleeve *b*⁴ and the upper end *b*⁵ of the frame *b'*. At the upper end of the shaft *b* is attached a pipe *b*⁶ by means of which the air may be drawn from the interior of the shaft *b* so as to create a vacuum for holding the glass upon the plate holder *b*²⁵. A gear *b*⁷ is mounted upon the shaft *b* and is adapted to engage the drive gear *b*⁸ supported upon the drive shaft *b*⁹. The drive shaft *b*⁹ is supported by the frame. A drive pulley *b*¹¹ is mounted upon the shaft *b*⁹. The block *b*¹² is mounted upon the shaft *b* and has a pin *b*¹³ extending downwardly parallel to the shaft *b*. The block and pin are adjustable by means of the screws *b*¹⁴ and *b*¹⁵ respectively. A section of the shaft *b*, below the block *b*¹² is screw threaded, and upon such threaded section are mounted the nuts *b*¹⁶, *b*¹⁷ and the loose collar *b*¹⁸. Mounted upon the collar *b*¹⁸ and extending downwardly therefrom and parallel with the shaft *b* is the roller arm *b*¹⁹ supporting the roller *b*²⁰. The pattern device *b*²¹ is mounted upon the upper end of the sleeve *b*⁴ and is engaged by the roller *b*²⁰. The lifting arm *b*²² is slidably supported by the sleeve *b*⁴ and extends downwardly parallel to shaft *b*. Fingers forming a yoke upon the lower end of the lifting arm extend about the shaft *b* and engage the lock nuts *b*²³ and *b*²⁴ mounted upon a threaded section of the shaft *b* above the plate holder *b*²⁵ mounted on the bottom of the shaft *b*. The vacuum plate holder *b*²⁵ has a series of lugs *b*²⁶ formed on its under surface and interiorly to its rim *b*²⁷ that cooperate with the rim in holding the plate of glass firmly. The fingers *b*²⁸ formed on the vacuum plate are adapted to center the glass plate upon the vacuum plate holder. The hand lever *b*²⁹ is pivotally mounted upon the sleeve *b*⁴ and is adapted to engage the pin *b*³⁰ formed on the lifting arms *b*²². By means of the lever *b*²⁹ it is possible to move the lifting arm upward thereby causing the fingers forming the yoke to engage the nuts *b*²³ and *b*²⁴ and move the shaft upward. The pin *b*³¹, suspended from the lever by the chain *b*³² is inserted in any one of a series of

perforations b^{33} formed in the frame b' , after moving the lever below such perforation, thereby holding the shaft and the vacuum plate from contacting the grinding stone. The cap b^{34} seals the upper end of the shaft b .

The support bar D extends horizontally across the center of the grindstone. The shaft d' is mounted upon the bar D in vertical alignment with the center of the grindstone a . A pulley d^2 is mounted upon the shaft d' . The collar d^3 is mounted upon the shaft d' and limits the extent to which the shaft d' extends through the bar D. Upon that part of the shaft d' extending through the bar D is mounted a disk d^4 having a dovetail formed on it. A block d^5 having a dovetailed groove is mounted upon the disk and is adjustably attached to the disk by means of the screw d^6 . The rod d^7 is pivotally mounted upon the block d^5 by means of the nut d^8 , and is attached to the sleeve b^2 .

The operation of our device is as follows:

The vacuum plate holder b^{25} is moved away from the grindstone a by means of the lever b^{20} . The lever is moved so that its end removed from the lifting arm will be below one of the perforations b^{33} , whereupon the pin b^{31} is inserted in the perforation. The pin prevents the return of the lever to its normal position. As the lever is moved toward the perforations, it engages the lifting arm. The shaft b is moved upward because of the action of the lever upon the lifting arm which in turn engages the nut b^{23} on the shaft b . The gear b^7 is consequently disengaged from the gear b^8 and the rotative motion of shaft b will cease. The disk b^3 is then adjusted upon the disk b^2 until the shaft b will be at an angle to the grindstone that will give the desired angle to the bevel that is to be ground upon the plate. This adjustment is made by loosening the bolts b^{24} and then revolving the disk b^3 upon disk b^2 . The bolts are then tightened. A plate of glass is then placed in engagement with the plate holder and the air withdrawn from the plate holder and the hollow shaft b by means of the pipe b^6 , the external air pressure retaining the plate upon the holder. The lever is released by withdrawing the pin b^{31} from the perforation b^{33} , and the plate of glass is moved into contact with the grindstone a , whereupon the roller b^{20} is adjusted to a distance from the pattern b^{21} equal to the depth of the bevel that is to be ground upon the plate. The block b^{12} and pin b^{13} support the collar b^{18} and the roller arm b^{19} , and can be adjusted in conjunction with the roller arm to vary the depth of the bevel. The shaft b is then released by completely releasing the lever, the gear b^7 engages the gear b^8 and the grindstone operates upon the plate while

the drive gear revolves the shaft b . If a round plate of glass is to be beveled a pattern b^{21} , having a straight upper edge, as shown in Fig. 3 by dotted line S, is used. If an oval plate is to be beveled, a pattern having the lobes as disclosed in the drawing, is used. The size of the lobes are varied in accordance with the shape of the plate to be ground. As the roller b^{20} engages the lobes, the shaft b will be longitudinally reciprocated, thereby making it possible to smoothly and accurately bevel an oval plate. The carriage B is reciprocated horizontally by means of the rod d' and the eccentric mechanism mounted upon the shaft d' . Motion is applied to the shaft d' by means of the pulley d^2 and to the shaft b^9 by means of the pulley b^{11} .

When the desired bevel is ground upon the glass plate, the roller b^{20} will continuously engage the pattern b^{21} and although the shaft may still be revolving, the plate will be held out of engagement with the grindstone. By means of this contact between the roller and the pattern, a perfect bevel can be ground upon the glass plate. The plate holder is then lifted by means of the lever b^{29} , and the finished plate removed therefrom by reducing the vacuum in the plate holder.

A machine embodying our invention and employing a polishing wheel or disk instead of the grindstone, can be used to polish the glass plates, and in view of any kind of grinding or polishing wheel being equally adaptable to be used in accordance with our disclosures, we do not limit our invention to a grindstone or polishing wheel of specific functions. The face of the glass can be ground and polished as well as can a bevel be ground on the plate, by a device embodying our disclosures and we do not limit our invention to specific type of plate glass grinding.

What we claim is:

1. In a machine for grinding bevels upon glass plates the combination of a grindstone, a sleeve, means for mounting the sleeve adjacent to the grindstone, a shaft mounted reciprocally and rotatably in the sleeve, a pattern mounted upon the sleeve and a contact device secured upon the shaft and adapted to contact with the pattern device.

2. In a machine for grinding glass plates the combination of a grindstone, a support bar mounted adjacent to the grindstone and having a longitudinal way formed thereon, a carriage mounted upon the way, a sleeve secured to the carriage, a shaft mounted reciprocally and rotatably in the sleeve and a plate holder mounted upon the shaft.

3. In a machine for grinding bevels upon glass plates the combination of a grindstone, a support bar mounted adjacent to the grindstone and having a longitudinal way formed thereon, a carriage mounted upon the way,

a sleeve secured to the carriage, a shaft mounted reciprocally and rotatably in the sleeve, a plate holder mounted upon the shaft, a pattern device carried by the sleeve, and a contact device secured to the shaft and adapted to engage the pattern.

4. In a machine for grinding glass plates the combination of a grindstone, a support bar mounted adjacent to the grindstone, a carriage mounted reciprocally upon the support bar, a guide sleeve mounted adjustably upon the carriage, a shaft mounted revolvably and reciprocally in the sleeve and a plate support mounted upon the shaft.

5. In a machine for grinding glass plates the combination of a grindstone, a support bar mounted adjacent to the grindstone and having guide ways formed thereon, a carriage comprising disks revoluble in relation to each other, one of the disks being mounted upon the ways, a guide sleeve secured to the other disk, a shaft mounted revolvably and reciprocally in the sleeve and a plate support upon the shaft.

6. In a machine for grinding bevels upon glass plates the combination of a grindstone, a support bar mounted adjacent to the grindstone, ways formed upon the support bar, a carriage comprising disks revolubly in relation to each other, one of the disks being mounted upon the ways, a sleeve secured to the other disk, a pattern device secured upon the upper end of the sleeve, a shaft mounted revolvably and reciprocally in the sleeve, a contact device secured to the shaft and adapted to contact with the pattern device and a plate support secured upon the shaft.

7. In a machine for grinding glass plates the combination with a grindstone having a horizontal grinding face, of means to hold the plates, means to revolve the plate holding means, and means adapted to horizontally reciprocate the plate holding means over the grinding face.

8. In a machine for grinding bevels upon glass plates the combination with a grindstone of means to hold a plate of glass, and means to longitudinally reciprocate the plate holder, such reciprocating means comprising

a revoluble shaft, a roller arm mounted upon the shaft, a roller supported by the roller arm and a fixed pattern device engaging the roller.

9. In a machine for grinding glass plates, the combination of a grindstone, a plate holder, a driven shaft attached to the holder, a gear upon the driven shaft, a frame reciprocally supporting the driven shaft adjacent the grindstone, a drive shaft supported on the frame in parallelism with the driven shaft, and a gear upon the drive shaft adapted to engage the gear on the driven shaft.

10. In a machine for grinding glass plates, the combination of a grindstone, a plate holder, a driven shaft attached to the holder, a gear upon the driven shaft, a frame reciprocally supporting the driven shaft adjacent the grindstone, a drive shaft supported on the frame in parallelism with the driven shaft, a gear upon the drive shaft adapted to engage the gear on the driven shaft, and means adapted to move the driven shaft in the direction of its axis, whereby the gears may be moved into engagement.

11. In a machine for grinding glass plates, the combination of a grindstone, a plate holder, and means to revolve the plate holder when the plate is in engagement with the grindstone and comprising a shaft attached to the holder, a frame supporting the shaft and upon which the shaft may be moved in the direction of its length, a revoluble drive shaft mounted on the frame in parallelism with the first mentioned shaft, and gears on the shafts adapted to engage when the first mentioned shaft is moved to an operative position, wherein the glass plate engages the grindstone, and the gears being disengaged when the first mentioned shaft is moved to an inoperative position wherein the plate is withheld from the grindstone.

In witness whereof, we have hereunto subscribed our names this 14th day of May, 1920.

WALTER J. HERSCHEDE.
WALTER EBERHARDT.