No. 791,897. PATENTED JUNE 6, 1905.

J. J. GIBIAN & G. W. FREEMAN.

GLASS BEVELING MACHINE.

APPLICATION FILED JUNE 29, 1904.

3 SHEETS—SHEET 1.

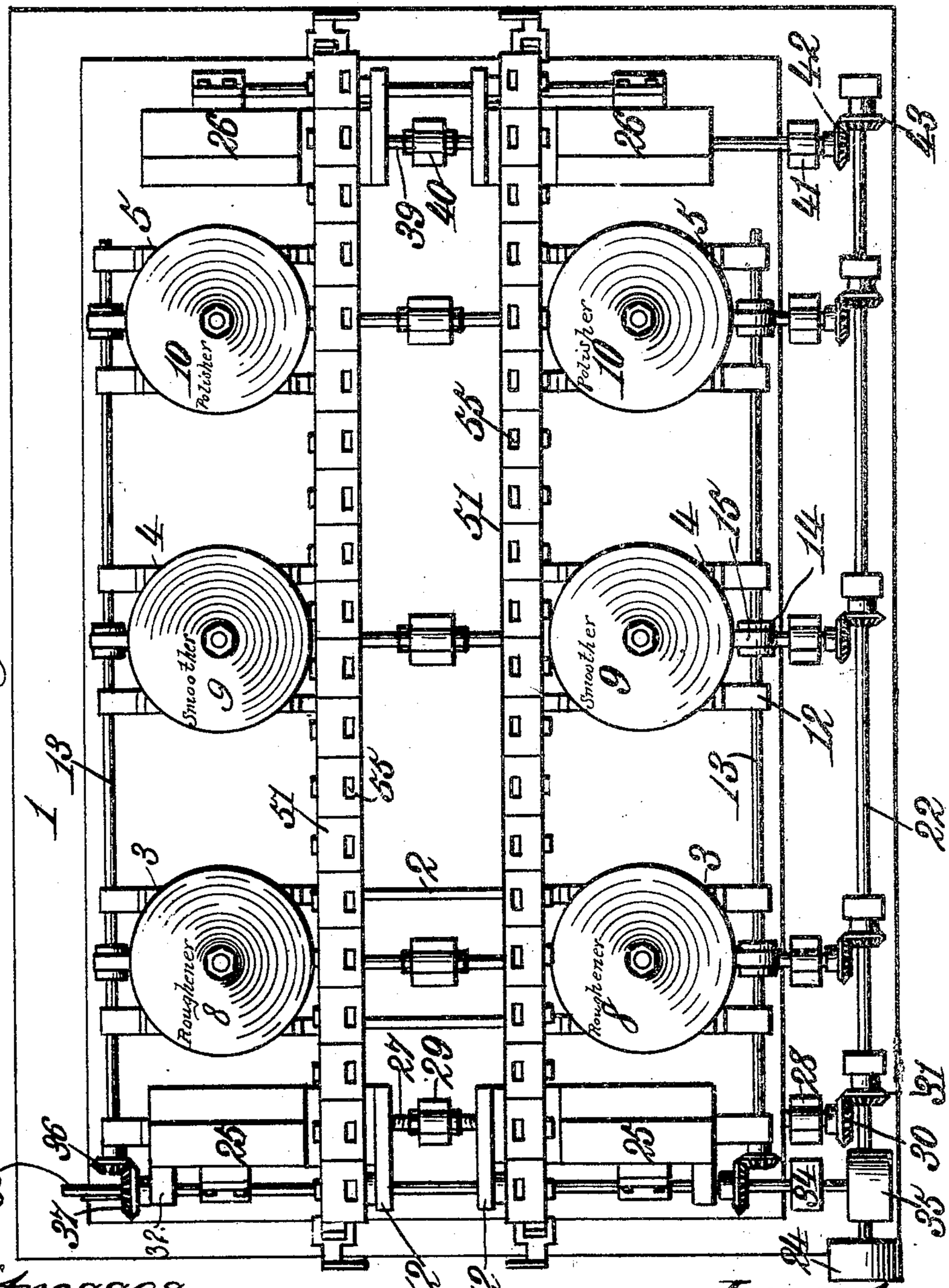

Fig. 1.

Witnesses.
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3 SHEETS—SHEET 2.

Fig. 2.

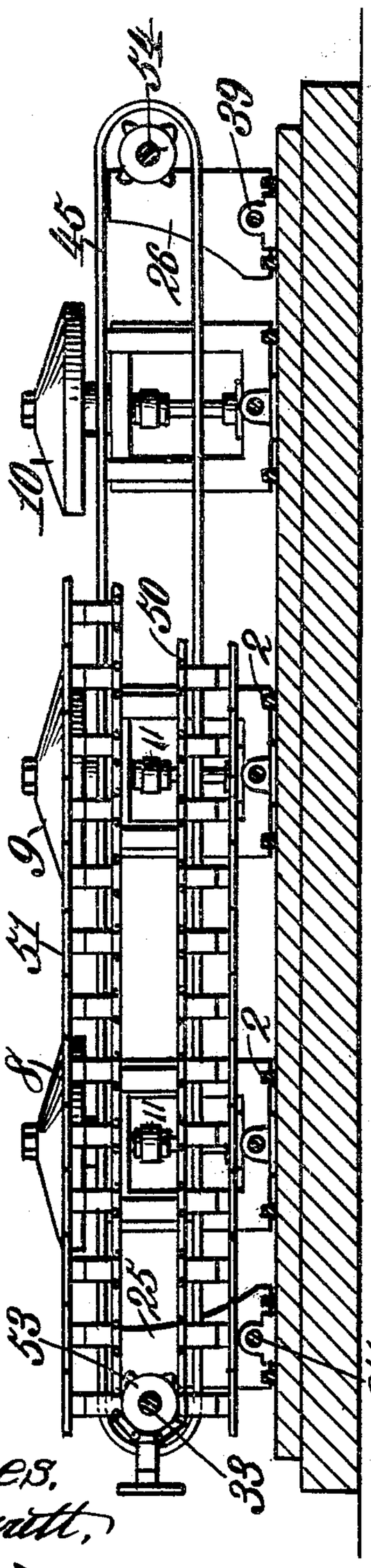

Fig. 5.

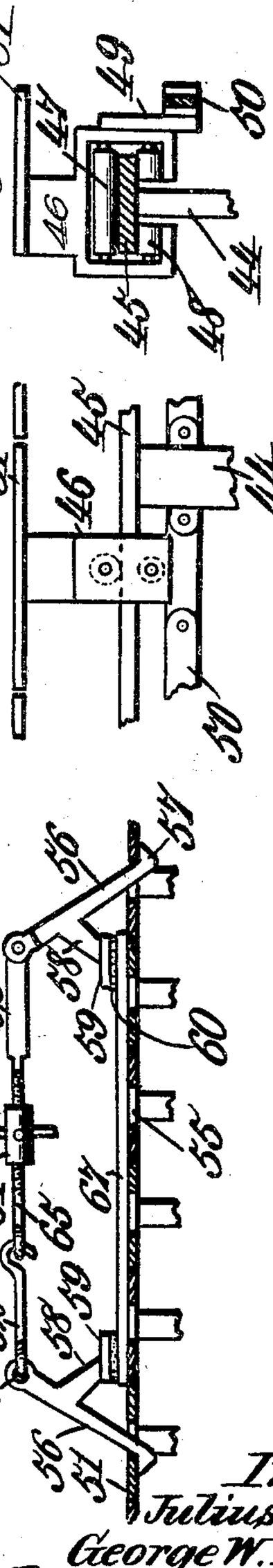

Fig. 6.

Fig. 1.

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3 SHEETS—SHEET 3.

Fig. 3.

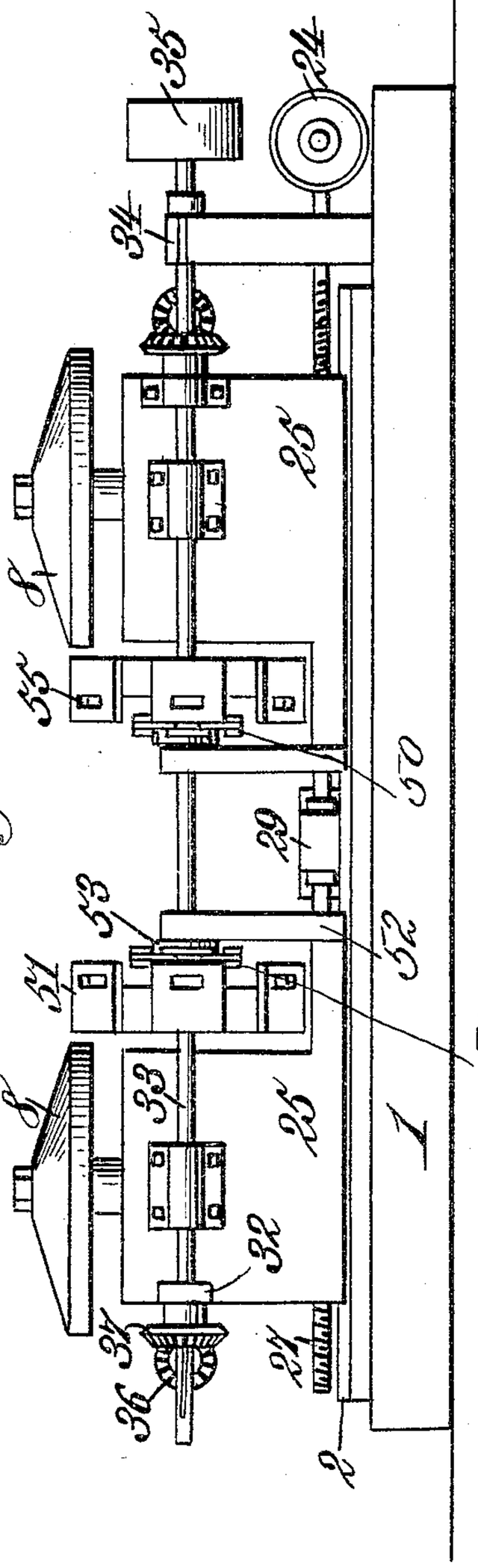
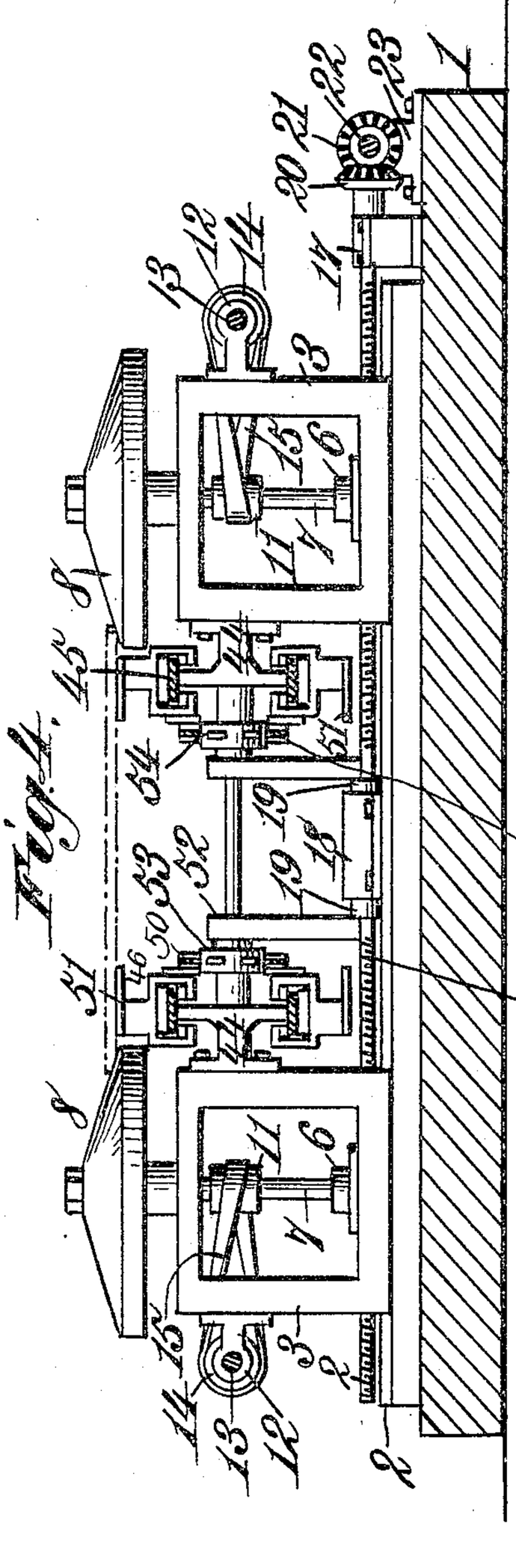


Fig. 4.



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No. 791,897. Patented June 6, 1905.

UNITED STATES PATENT OFFICE.

JULIUS J. GIBIAN, OF HOBOKEN, AND GEORGE W. FREEMAN, OF ELIZABETH, NEW JERSEY.

GLASS-BEVELING MACHINE.

SPECIFICATION forming part of Letters Patent No. 791,897, dated June 6, 1905.

Application filed June 29, 1904. Serial No. 214,674.

To all whom it may concern:

Be it known that we, JULIUS J. GIBIAN, residing at Hoboken, in the county of Hudson, and GEORGE W. FREEMAN, residing at Elizabeth, in the county of Union, State of New Jersey, citizens of the United States, have invented new and useful Improvements in Glass-Beveling Machines, of which the following is a specification.

This invention relates to a glass-beveling machine in which the glass is first subjected to the action of reducing or roughening mills or stones, then to the action of smoothing mills or stones, and finally to the action of polishing-mills, the several operations being carried out in a continuous manner.

Among objects of the invention may be mentioned as a salient feature the arrangement of a set of roughening, smoothing, and polishing mills on each side of a traveling table with means for simultaneously adjusting respective sets of mills toward or from each other in order to polish plates of glass of different widths or respective sides of the same plate having different dimensions in length and breadth.

Another object of the invention relates to the construction and arrangement of the movable table for carrying the plates of glass past the different mills.

A still further object of the invention relates to novel means for clamping the glass plates upon the movable table.

In addition to the above other objects of the invention relate to novel details of construction and to combinations and operations of parts, all of which will be clearly set forth in the detailed description following.

That which we claim as our invention will be set forth in the claims following the specification.

In order that the invention may be clearly understood, we have illustrated the same in the accompanying sheets of drawings, in which—

Figure 1 is a top plan view of the machine. Fig. 2 is a longitudinal sectional view through the center thereof. Fig. 3 is an end elevation. Fig. 4 is a transverse sectional view on the line 4 4 of Fig. 1. Fig. 5 is an enlarged sectional detail view of a portion of one of the tracks, showing a number of carriages mounted thereon and a portion of the sprocket-chain supported from said carriages. Fig. 6 is a sectional view, also on an enlarged scale, taken through one of the tracks; and Fig. 7 is an enlarged sectional detail view showing the manner of clamping a plate upon the traveling carrier.

The machine as a whole is mounted upon a suitable base 1. Upon this base and arranged transversely of the length of the machine are a series of parallel rails 2. Slidably mounted on respective pairs of these rails are a series of mill-frames, (indicated, respectively, by 3 3, 4 4, and 5 5.) The bottoms of these frames are suitably grooved or otherwise fashioned to engage the rails 2, so as to slide smoothly on the same and be guided thereby. The frames 3, 4, and 5 are identical in construction, each frame being rectangular in shape, as shown, and open, preferably, at the sides and ends, the respective frames 3 3, 4 4, and 5 5 being arranged directly opposite to each other. Supported on the upper side of the bottom of each of these frames is a cup-bearing 6, in which is supported the lower end of a shaft 7, which extends through the top of the frame and has fixedly secured on its upper end a mill. The shafts 7 of the respective frames 3 are provided with roughening-mills 8, the shafts of the respective frames 4 with smoothing-mills 9, and the shafts of the respective frames 5 with polishing-mills 10. Mounted on each of the shafts 7 within the respective frames is a pulley 11. Mounted in bearings 12, secured at opposite ends on the outer side of the respective mills, and extending approximately from end to end of the machine is a shaft 13, provided opposite each frame with a pulley 14, and crossed belts 15 pass from the pulley 14 on said shaft over the pulleys 11 on the mill-shafts 7. Extending transversely through the bottoms of each of the sets of mill-frames 3 3, 4 4, and 5 5 and having screw-threaded engagement with such frames is a screw-shaft 16, supported near opposite ends in bearings 17, and in the center of the machine between the respective sets of mills is provided a stationary bearing

18, through which the shaft 16 passes and which is provided at opposite ends with collars 19, engaging the shaft 16 to prevent endwise movement thereof. As shown in the drawings, the portion of the shaft 16 passing through one of the mills—say 3—is provided with a right-hand thread, while the portion of the same shaft passing through the corresponding frame 3 on the opposite side of the machine is provided with a left-hand thread. It follows, therefore, that when the shafts 16 are turned in one or the other direction the respective sets of mill-frames may be moved toward or from each other. In order to move all of the mill-frames simultaneously, I provide on the end of each of the shafts 16 on one side of the machine a bevel-gear 20, each of said bevel-gears 20 meshing with a bevel-gear 21, secured on a shaft 22, supported in bearings 23 on the base 1, said shaft extending lengthwise of the machine approximately from end to end thereof. One end of the shaft 22 is provided with a pulley 24, by means of which it may be revolved through the medium of a belt, as will be understood. It will thus be seen that by turning the shaft 22 in one or the other direction all of the shafts 16 may be rotated in the desired direction to bring the sets of mill-frames toward or from each other.

Mounted to slide on the rails 2 at opposite ends of the machine are bearing-blocks, (indicated, respectively, by the numerals 25 25 and 26 26.) A right and left hand threaded rod 27 passes through and has screw-threaded engagement with the bearing-blocks 25 and is supported in bearings 28 and a central bearing 29 in the same manner as the shafts 16, said shaft 27 having on one end a bevel-gear 30, meshing with a bevel-gear 31 on the shaft 22. The bearing-blocks 25 will therefore be moved toward and from each other in unison with the respective sets of mill-frames. Mounted in suitable bearings 32 on the sides and ends of the bearing-blocks 25 is a shaft 33, projecting a suitable distance from the block 25 at one side of the machine and supported near its outer end in a bearing 34 and beyond said bearing provided with a pulley 35.

The shaft 13, which, as previously described, carries the pulleys for rotating the mills, is provided at one end with a bevel-gear 36, which meshes with a bevel-gear 37, which is splined on the shaft 33, so as to rotate with said shaft and be capable of sliding on the same. The bevel-gear 37 lies against the upright bearing 32 on the side of the adjacent bearing-block 25, and thus as the said bearing-block moves outward it will carry the bevel-gear 37 along the shaft 33 and as the said bearing-block moves inward the bevel-gear 37 will be carried inward by the bodily movement of the bevel-gear 36, due to the movement of the mill-frames carrying the shaft 13. Thus the bevel-gears 36 and 37 will always be maintained in mesh. The bracket mounted on the side of the bearing-block 25 has a bearing 38 for supporting the end of the shaft 13.

The bearing-blocks 26 at the opposite end of the machine to that described are also adapted to be moved in unison with the mill-frames by means of a right and left hand screw-threaded rod 39, supported centrally in a stationary bearing 40 and near its ends in bearings 41 and provided at one end with a bevel gear 42, meshing with a bevel-gear 43 on the shaft 22.

Mounted on the inner side and near opposite ends of each of the mill-frames 3, 4, and 5 are brackets 44, having upwardly and downwardly projecting arms, and to the brackets on each set of mills is secured an endless track 45, said tracks extending between the two sets of mills from end to end of the machine and each track being movable with the respective sets of mills and the respective bearing-blocks 25 and 26. Mounted on the track 45 are a series of carriages 46, which embrace the track 45 and each of which has mounted therein a roller 47, adapted to bear on the outer side of the track, and rollers 48, adapted to bear on the inner side of the track. Secured to the inner side of each of the carriages 46 is a hanger 49, and these hangers are secured to a sprocket-chain 50. Mounted on the outer end of each of the carriages 46 and projecting inward a short distance is a platform 51, the respective platforms on the opposite side of the machine being diametrically opposite each other and constitute the endless table hereinbefore referred to. Each of the bearing-blocks 25 is cut away to provide an offset portion 52, and in the space between this offset portion and the body of the block 25 is located a sprocket-wheel 53, which is splined on the shaft 33, so as to rotate the said shaft, but at the same time be capable of sliding over the same. Corresponding sprocket-wheels 54 are suitably mounted in the bearing-blocks 26, and over the sprocket-wheels 53 and 54 pass the sprocket-chains 50. As both sprocket-wheels 53 are rotated from the shaft 33 and as the sprocket-chains 50 are carried by the carriages 46, it follows that the platforms 51 on each side of the machine will move in unison from one end of the machine to the other as the shaft 33 is revolved.

We will now proceed to describe the manner of fastening the plates of glass on the movable table: Each of the platforms 51 is provided near its outer edge with a transverse slot 55. At suitable intervals along the length of the table we provide a series of clamp-levers 56, one end of which is inserted through the slot 55 in the platform and is provided with an angle portion 57 to engage the under side of said platform. Projecting from one side of each clamp-lever 56 is an arm 58, carrying a foot-piece 59, the under

side of which is provided with a rubber pad or block 60. Each of the clamp-levers 56 is provided near its outer end with an eye 61, and in the eye of one of these clamp-levers is pivotally mounted a hook 62. The eye of the adjacent clamp-lever 56 has pivotally mounted therein a screw-threaded rod 63, the free end of which enters one end of a correspondingly-threaded sleeve 64. In the opposite end of the sleeve 64 is mounted a screw-eye 65, which is oppositely screw-threaded to the rod 63. The sleeve 64 is provided with means, such as the projecting fingers 66, whereby it may be rotated. The hook 62 is adapted to engage in the screw-eye 65, and by turning the sleeve 64 in the proper direction the rod 63 and the screw-eye 65 will be drawn toward each other, thus pressing the foot-pieces 59 firmly upon the glass plate 67, which, as will be understood, is supported by the platforms 51 at opposite sides of the space between the mills, thereby firmly holding the plate of glass in position to be operated upon. It will be understood that pairs of these clamping members will be located at corresponding points on opposite sides of the moving table and will clamp opposite sides of the plate placed upon the table.

In operation power is applied to the pulley 35, which will, through the medium of the devices hereinabove described, operate to revolve the series of mills 8, 9, and 10 and also cause movement of the sprocket-chains 50. A plate of glass being clamped on the moving table in the manner described, the pulley 24 is turned to adjust the mills the requisite distance apart to impart the desired bevel to the glass. Sand and water are usually applied to the roughening-mills 8, and as the glass passes by these mills the proper amount of glass is ground therefrom to impart the bevel on each side of the glass. As the table continues to move the glass is brought between the smoothing-mills 9, which are usually constructed of New Castle stone, to which water is constantly applied, and the ground surface of the glass is smoothed and rendered semi-opaque. The glass is then carried between the polishing-wheels 10, the surface of which is usually of felt and has water and rouge applied thereto, and the bevel portion of the glass is then polished until its transparency is equal to the remaining part of the plate. The plate is removed from the traveling table before the curved portion of the table at the end of the machine is reached, and this is done by turning the sleeve 64 and disengaging the hook 62 from the screw-eye 65, when the clamp-levers 56 may be turned out of contact with the plate and the same removed.

The above operation will have resulted in beveling two sides of the plate. If the plate is of greater length in one direction than the other, the mills 8, 9, and 10 are adjusted the requisite distance apart, the plate again clamped on the table, and its straight edges subjected to the beveling operation above described.

In operation the plates of glass are continuously applied to the moving table as the same travels between the mills, so that a great saving of time is effected and the operation of the apparatus is continuous.

For convenience of description we have referred to the parts 8, 9, and 10 generally as "mills," and this term will be used where required in the claims.

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

1. A glass-beveling machine comprising an endless carrier, two sets of mills arranged, respectively, on opposite sides of said carrier, and means for adjusting said mills toward and from each other.

2. A glass-beveling machine comprising a traveling carrier, two sets of mills arranged, respectively, on opposite sides of said carrier, and means for simultaneously adjusting all of said mills toward and from each other.

3. A glass-beveling machine comprising an endless carrier, two sets of mills arranged, respectively, on opposite sides of said carrier, means for clamping plates of glass to said carrier, and means for adjusting said mills toward and from each other.

4. A glass-beveling machine comprising an endless carrier, a series of slidably-mounted frames mounted, respectively, on opposite sides of said carrier, a mill mounted in each of said frames, means for rotating said mills, and means for adjusting said frames toward and from each other.

5. A glass-beveling machine comprising a traveling carrier, a series of slidably-mounted frames located, respectively, on opposite sides of said carrier, a mill mounted in each of said frames, means for rotating said mills, and means for simultaneously adjusting all of said frames toward and from each other.

6. A glass-beveling machine comprising a series of frames arranged in pairs opposite each other, and in alinement on opposite sides of the machine, a traveling carrier mounted on the frames at each side of the machine, means for moving both of said carriers in unison, means for adjusting all of said frames simultaneously toward and from each other, means for clamping a plate of glass upon said carriers, a mill mounted in each of said frames, and means for rotating all of the mills.

7. A glass-beveling machine comprising a series of slidably-mounted frames arranged in pairs opposite each other and in alinement on opposite sides of the machine, a mill mounted in each of said frames, means for rotating said mills, means for simultaneously adjusting all of said frames toward and from each other, an endless track mounted on each set of frames on opposite sides of the machine, a traveling

carrier mounted on each of said tracks, and means for simultaneously moving both of said carriers.

8. A glass-beveling machine comprising a series of frames arranged in sets on opposite sides of the machine and in pairs opposite each other, a rod having oppositely-screw-threaded portions engaging the respective pairs of frames, means for turning all of said rods simultaneously to adjust the frames toward and from each other, a mill mounted in each of said frames, means for revolving said mills, and a carrier adapted to travel in the space between the respective sets of mills.

9. A glass-beveling machine comprising a series of slidably-mounted frames arranged in alinement in sets on opposite sides of the machine and in pairs opposite each other, an endless track supported by each set of frames, a series of carriages mounted to travel on each of said tracks, a sprocket-chain secured to said carriages, sprocket-wheels engaging said sprocket-chains, means for moving said sprocket-chains in unison, means for clamping a plate of glass to said carriages, a mill mounted in each of said frames, and means for rotating said mills.

10. A glass-beveling machine comprising two sets of mills arranged opposite each other, each set comprising a roughening-mill, a smoothing-stone, and a polishing-wheel, means for revolving said mills, means for simultaneously adjusting all of said mills toward and from each other, and means for passing a plate of glass between said mills.

11. In a glass-beveling machine, in combination with rotatable mills and a traveling carrier comprising platforms having slots therein, means for clamping a plate of glass to said carrier comprising clamp-levers each of which has a bent end inserted in one of said slots, and a foot-piece adapted to bear upon the plate of glass, each pair of said clamp-levers being provided at their free ends with means for drawing said free ends toward each other.

12. A clamping device for glass-beveling machines, comprising a pair of levers each of which has an engaging device at one end and intermediate its ends is provided with a foot-piece and having its opposite end provided with an eye, a hook mounted in the eye of one of said clamp-levers, a screw-threaded rod mounted in the eye of the other clamp-lever, a screw-eye oppositely threaded to said rod, and a sleeve engaging said screw-eye and rod, the combination operating as described.

In testimony whereof we have hereunto set our hands in presence of two subscribing witnesses.

JULIUS J. GIBIAN.
GEORGE W. FREEMAN.

Witnesses:
EDWARD L. STREETER, Jr.,
RAY B. BROWN.