No. 709,020. Patented Sept. 16, 1902.

W. LAHODNY.

GLASS GRINDING AND POLISHING MACHINE.

(Application filed Mar. 6, 1902.)

(No Model.)

3 Sheets—Sheet 1.

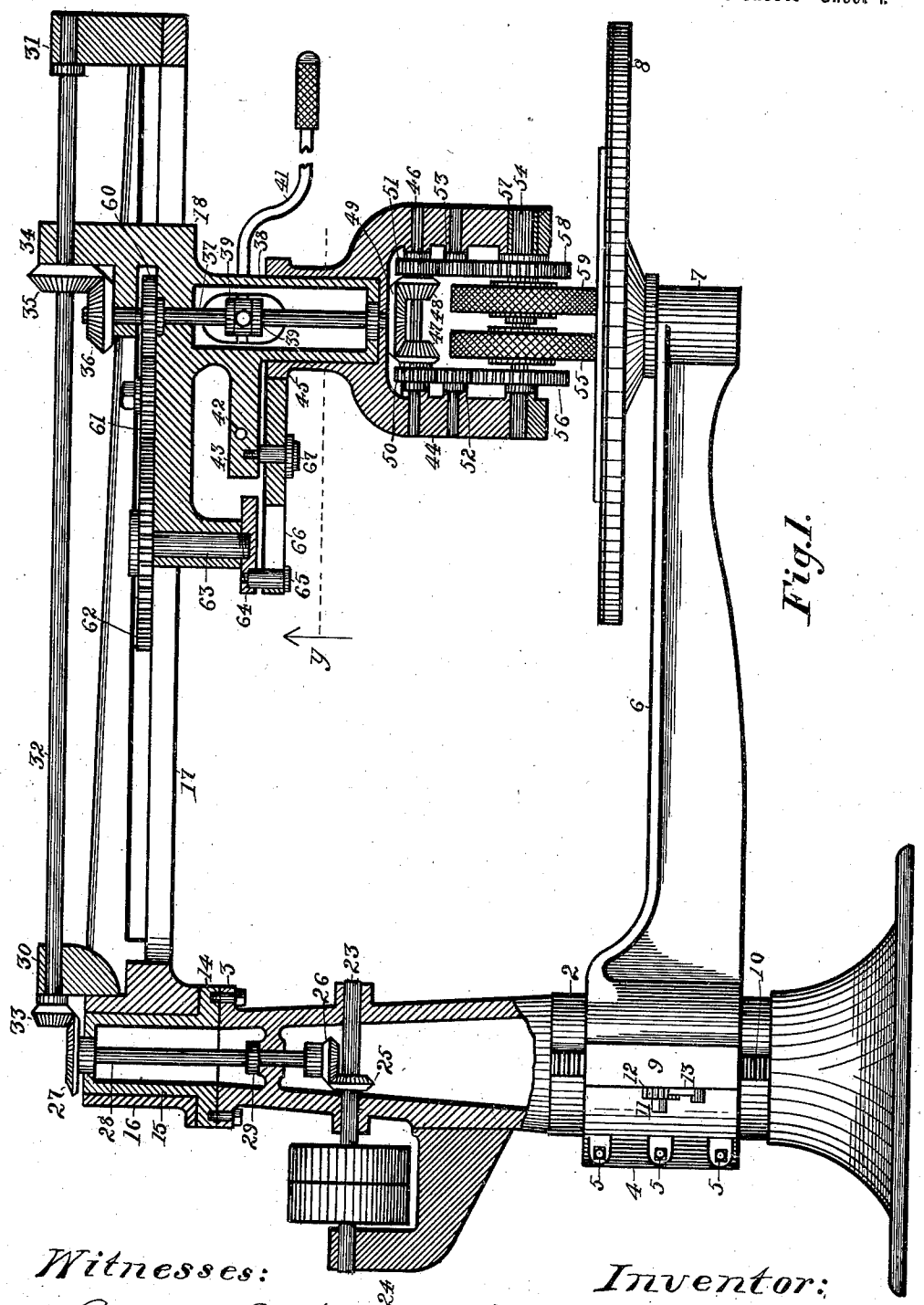


Fig. 1.

Witnesses:
Agnes Caspar.
Maude Gwisler.

Inventor:
William Lahodny,
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THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

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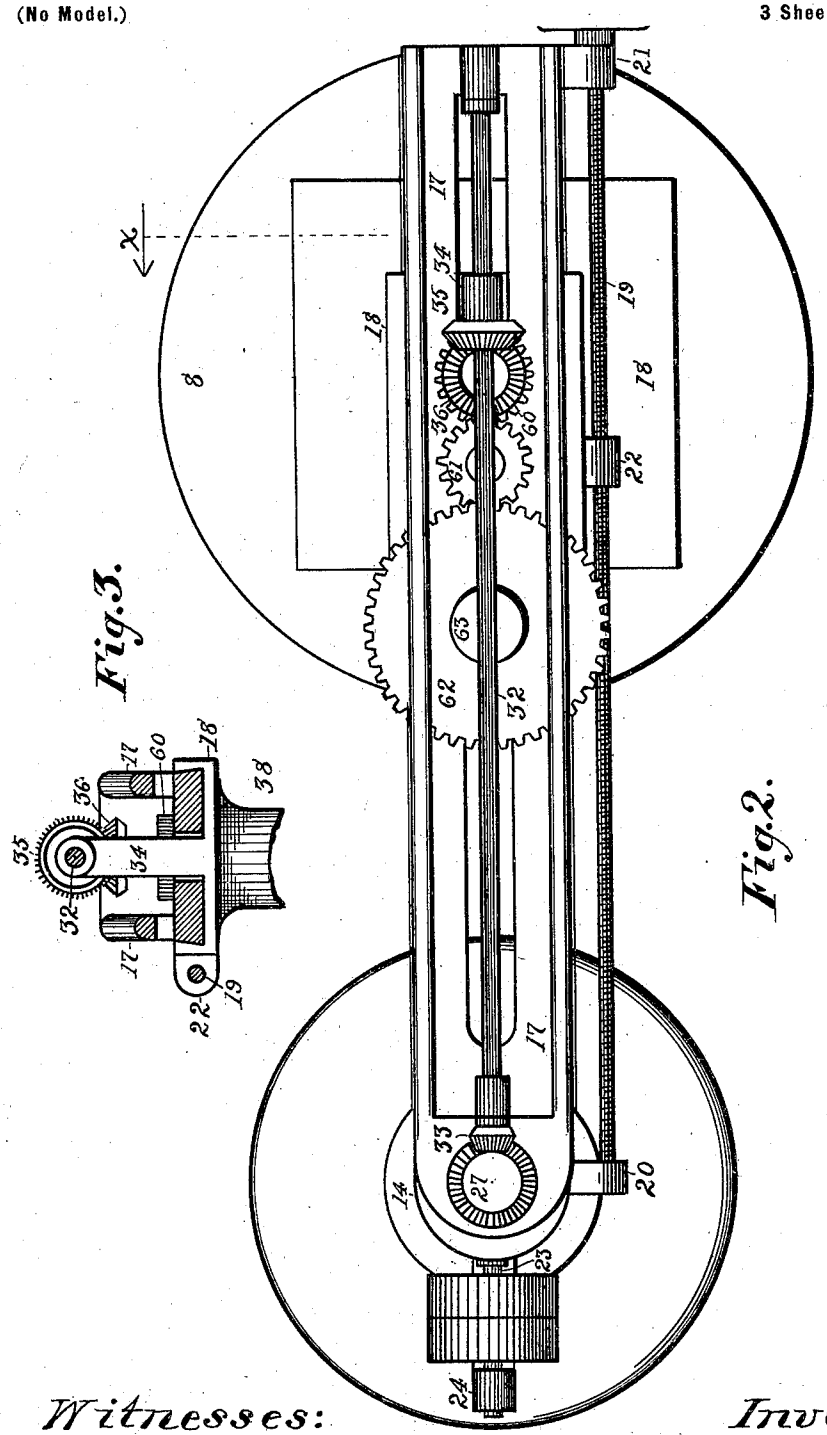


Fig. 2.

Fig. 3.

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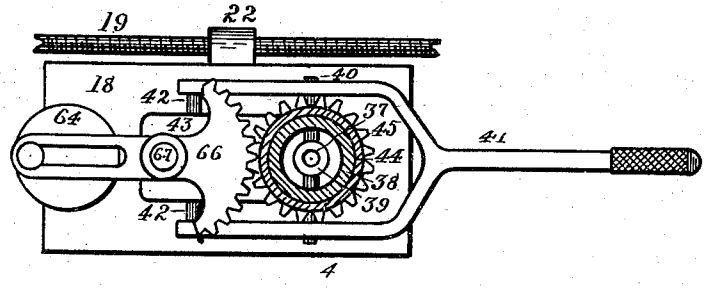


Fig. 4.

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UNITED STATES PATENT OFFICE.

WILLIAM LAHODNY, OF AKRON, OHIO.

GLASS GRINDING AND POLISHING MACHINE.

SPECIFICATION forming part of Letters Patent No. 709,020, dated September 16, 1902.

Application filed March 6, 1902. Serial No. 96,919. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM LAHODNY, a citizen of the United States, residing at Akron, in the county of Summit and State of Ohio, have invented a certain new and useful Improvement in Glass Grinding and Polishing Machines, of which the following is a specification.

My invention has relation to improvements in machines for grinding glass and polishing the surface of glass; and the object of my invention is to produce a machine having a revoluble table adapted to be moved horizontally about a center to sustain the sheet of glass and power-driven mechanism to carry interchangeable grinding and polishing wheels, with mechanism to move said grinding and polishing mechanism vertically and horizontally to apply it to the glass plate and to cause it to traverse the plate in any direction and raise it from contact therewith when the work is completed.

To the aforesaid objects my invention consists in the peculiar and novel construction, arrangement, and combination of parts hereinafter described and then specifically pointed out in the claims, reference being had to the accompanying drawings, which form a part of this specification.

In the accompanying drawings, in which similar reference-numerals indicate like parts in the different figures, Figure 1 is a vertical longitudinal central section of the entire machine with a few parts not sectioned; Fig. 2, a plan; Fig. 3, a section at the line *x;* Fig. 4, a section at the line *y*.

Referring to the figures, 1 is a vertical metallic post, preferably hollow, having a broad base for steadiness, above which it is turned a true cylinder 2 for a portion of its height and thence tapers to a flanged top 3 for the purpose of adjustably securing the upper mechanism.

Surrounding the cylindrical portion 2 is a split sleeve 4, adapted to be tightened by bolts 5 and having from one side an integral horizontal arm 6, terminating in a short vertical longitudinal sleeve 7, in which is fitted to revolve the vertical axle of a horizontal circular plate or table 8. This table may be made in any preferred or desired manner, its upper surface being adapted to hold a plate of glass securely thereon. On one side of the sleeve 4 is an offset portion 9, forming the case of a vertical channel in which is placed a vertical rack 10, curved on its inner face to conform to the part 2, and there is journaled in the case 9 a short shaft 11, that bears a pinion that meshes in the rack 10, and a ratchet-wheel 12, arranged to be retained in a desired position by a pawl 13, by which the sleeve 4 and table 8 may be elevated and retained at any desired height.

Secured to the flange 3 is a similar flange 14, from which rises a cylindrical top 15, on which is fitted to revolve a sleeve 16, from one side of which projects a horizontal slotted arm 17, having raised sides or webs with outwardly-beveled outer faces forming a dovetailed guide for the transit of a carriage 18, to be described. This carriage 18 incloses the dovetailed guides of the arm 17 and is moved along the arm by means of a threaded shaft 19, which is supported in a bracket 20 on the sleeve 16 and a bracket 21 on the extreme outer end of the arm 17, and a threaded lug 22, projecting from the carriage 18, engages and meshes on the shaft 19, by which the carriage is longitudinally adjusted. Motive power for actuating the grinding mechanism on the carriage is conveyed thereto in the following manner: Journaled in the upper portion of the post 1 is a horizontal shaft 23, supported at its outer end by a bracket 24 and bearing between the bracket and the post 1 two pulleys, one tight on the shaft and the other loose, which are designed to receive actuating power from any suitable or preferred source.

Within the hollow portion of the post 1 and on the shaft 23 is a beveled gear 25, meshing into a bevel-gear 26, placed on the lower end of a vertical shaft 28, journaled in the post 1, substantially central therein, and which has at its upper end a bevel-gear 27. This shaft 28 is supported in its bearing by a tight collar 29. In the upper portion of the arm 17 and at each end thereof are brackets 30 and 31, which support a long splined shaft 32, bearing at its end adjacent to the post 1 a bevel-pinion 33, which meshes into the bevel-gear 27. From one end of the carriage 18 rises a post 34, which is arranged to inclose the splined long shaft 32. Adjacent

to this post 34 is a bevel-gear 35, which meshes into a horizontal bevel-gear 36, mounted at the upper end of a splined shaft 37, journaled in the carriage 18. This shaft 37 passes perpendicularly downward through a tube-like depending portion 38 of the carriage 18. On this shaft 37 are three collars, two tight ones 39 and a center collar between these two loose on the shaft 37 and bearing radial pins 40, which pins pass out of the tubular portion 38 through side openings and form a bearing for the side arms of a yoked lever 41, the fulcrums of which are two pins 42, which enter an extended arm 43 of the tubular portion 38. This lever is best shown in Fig. 4. The vertical movement of the shaft 37 is thus controlled by the lever 41, the shaft being splined to permit this motion. Surrounding the lower tubular portion 38 is a bifurcated revoluble head 44, which has its upper end formed with a spur-gear formation 45, and it bears in its lower portion between its extended arms a shaft 46. On the shaft 46 are two bevel-pinions 47 and 48, loosely mounted thereon, which receive motion in opposite directions from a bevel-gear 49 on the lower end of the vertical shaft 37. Attached to each of the bevel-pinions 47 and 48 are small spur-gears 50 and 51, which in turn mesh into idlers 52 and 53, mounted on stub-shafts in the arms of the head 44. Below the idlers 52 and 53 is a large transverse shaft 54, on which is mounted a grinding-wheel 55, of any material. This grinding-wheel is tight on the shaft 54 and is driven by a spur-gear 56, meshing into the idler 52. On the other end of the shaft 54 and extended along said shaft nearly to the wheel 55 is a sleeve 57, on which is mounted a spur-gear 58, which meshes into the idler 53, and likewise mounted on this sleeve 57 is a grinding-wheel 59, arranged by means of the preceding connecting mechanism to revolve in an opposite direction to the wheel 55.

It is evident from the preceding that the rotation of the upper bevel-gear 36 will revolve by means of the shaft 37 and the connected mechanism—the two grinding-wheels 55 and 59—rapidly in opposite directions. In order to cause the rotation desired of the head 46 on the tubular portion 38, the following mechanism is employed: Splined on the shaft 37 is a spur-gear 60 in the upper face of the carriage. This gear 60 meshes into an idler 61, also on the upper face of the carriage 18. This idler meshes into a large spur-gear 62, mounted on a vertical shaft 63, extended down from the carriage and bearing on its lower end a crank 64, in which crank is a crank-pin 65. This crank-pin 65 is arranged to operate the extended slotted end of a rocking arm 66, whose pivot is a pin 67, passing through the arm 66 and entering the stationary arm 43. The opposite end of the arm 66 is formed with an arc of a spur gear-wheel and arranged to mesh into the spur-gear 45 at the upper end of the head 44, so that as the crank 64 rotates it will cause the arm 66 to rock backward and forward, thereby rotating the head 44 backward and forward.

The operation of the machine is as follows: Power is communicated to the tight pulley on the shaft 23 through the bevels 25 and 26, to the shaft 28, to bevels 27 and 33, to shaft 32 by means of bevels 35 and 36, to shaft 37, to the grinding-wheels in the head 44. Accompanying this motion, the rotation of the shaft 37 through the spur-gears 60 and 61 and 62 and the crank 64, the head 44 is rotated in a continuous series of semirotations. The glass is placed on the table 8 and retained there by any suitable means, and through the threaded shaft 19 the carriage is carried backward and forward to any desired point on the surface of the glass. The extended arm 17 being of course capable of rotation on the head 15, any desired point on the glass is reached. During this process any desired pressure may be brought on the glass by means of the lever 41.

What I claim, and desire to secure by Letters Patent, is—

1. In a machine of the class designated, the combination of an upright supporting-post, a swinging arm pivoted on the upper end of said post, a carriage adapted to travel along said swinging arm, means mounted on said carriage for supporting grinding and polishing mechanism, means to convey power from said post through said swinging arm to said grinding and polishing mechanism, and means to cause said grinding and polishing mechanism to rotate less than a revolution.

2. In a machine of the class designated, the combination with a supporting-post, mechanism mounted on said post to receive power from any desired source, a swinging arm pivoted on said post, means to convey power from said post to said swinging arm, a carriage mounted on said arm, means to cause said carriage to travel along said arm, mechanism depending from said carriage for grinding and polishing glass, and means mounted on said carriage to cause said grinding and polishing mechanism to alternately revolve vertically less than a complete revolution.

3. The combination of a supporting-post, an arm pivoted to said post, a traveling carriage on said arm, a depending portion on said carriage, a head mounted on said depending portion capable of revolution on said portion, grinding and polishing wheels mounted in said head, means to convey power from said post to said grinding and polishing mechanism, and means to cause a partial revolution of said head, substantially as shown and described.

4. In a machine of the class designated, the combination of a supporting-post, an arm pivoted on said post, a traveling carriage on said arm, a depending portion on the under face of said carriage, a revoluble head on said depending portion, grinding and polishing mechanism in said head, means to convey

power from said post to said grinding and polishing mechanism, a rocking arm mounted in said carriage, a crank to operate said arm, and means to cause said arm to rotate said head a portion of a revolution.

5. The combination in a machine of the class designated, of a post, a swinging arm pivoted on said post, a carriage mounted on said arm, a head mounted on said carriage, a pair of grinding and polishing wheels mounted in said head, mechanism to cause said grinding and polishing wheels to revolve in opposite directions to one another, substantially as shown and described.

6. In a machine of the class designated, the combination of a supporting-post, of a swinging arm pivoted on said post, a carriage on said arm capable of longitudinal movement thereon, a head mounted on said carriage, a pair of grinding and polishing wheels mounted in said head, mechanism to cause said grinding and polishing wheels to revolve in opposite directions to one another, and means to cause said head to revolve on said carriage, substantially as shown and described.

7. The combination in a machine of the class designated, of a supporting-post, a swinging arm mounted thereon, a traveling carriage on said arm, a head mounted on said carriage, gear-teeth on the upper end of said head, two grinding and polishing wheels mounted in said head, mechanism to cause said wheels to rotate in opposite directions to one another, a rocking arm provided with teeth to mesh with the teeth on said head, and means to rock said arm, substantially as shown and described.

8. The combination in a machine of the class designated with a supporting-post of a swinging arm, a carriage slidable on said arm, a head mounted on said carriage, two grinding-wheels mounted in said head, means to cause said grinding-wheels to revolve in opposite directions to one another, and means to vary the vertical position of said head on said carriage as desired, substantially as shown and described.

In testimony that I claim the above I hereunto set my hand in the presence of two subscribing witnesses.

WILLIAM LAHODNY.

In presence of—
C. E. HUMPHREY,
MAUDE ZWISLER.