

(No Model.)

3 Sheets—Sheet 1.

A. J. NELLIS.
GLASS FINISHING MACHINE.

No. 517,358.

Patented Mar. 27, 1894.

Fig. 2

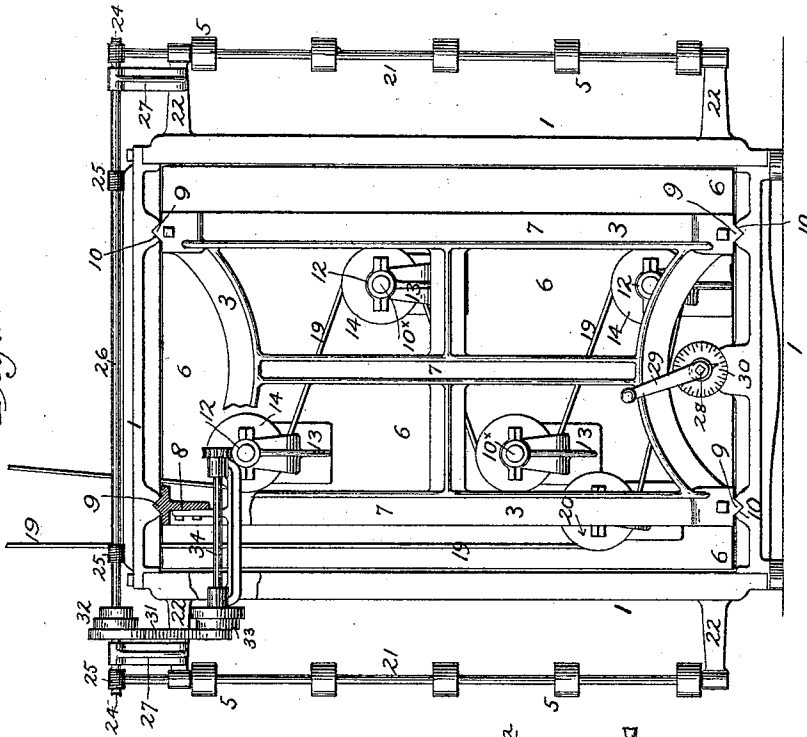
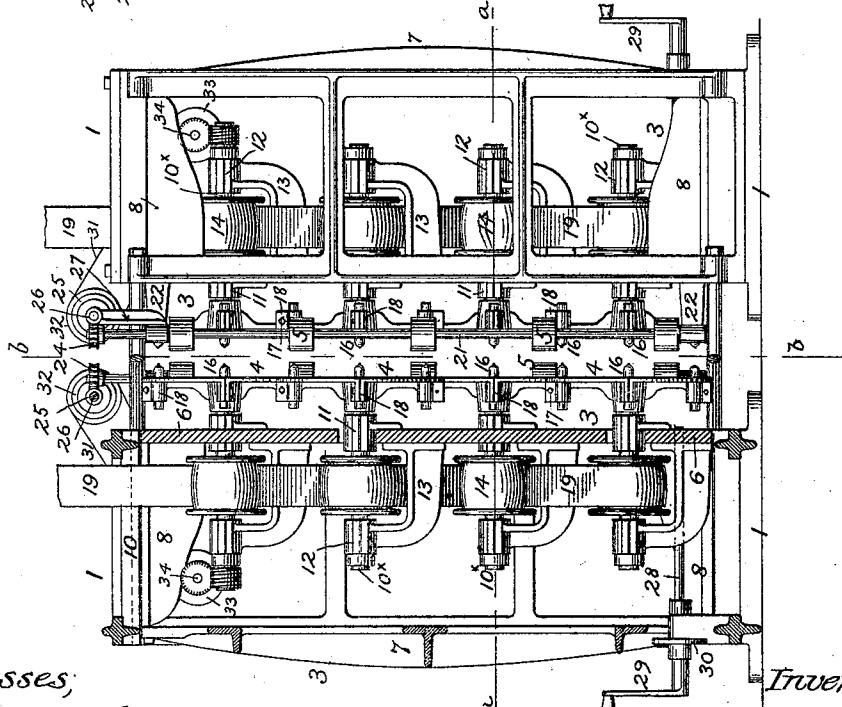


Fig. 1.



Witnesses;

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Inventor,

Aaron J. Nellis,
by his attorney,
P. T. Dodge

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Fig. 4.
ON LINE B-B.

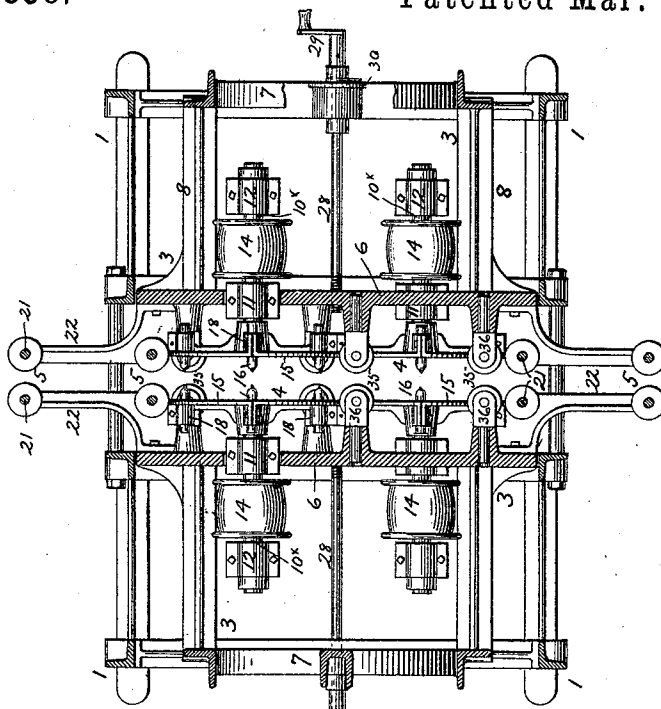
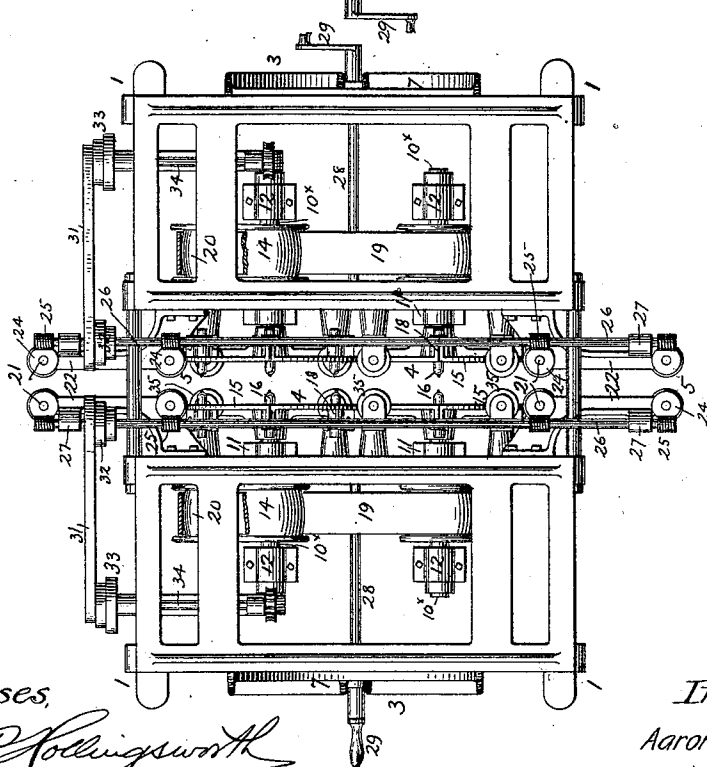


Fig. 3.



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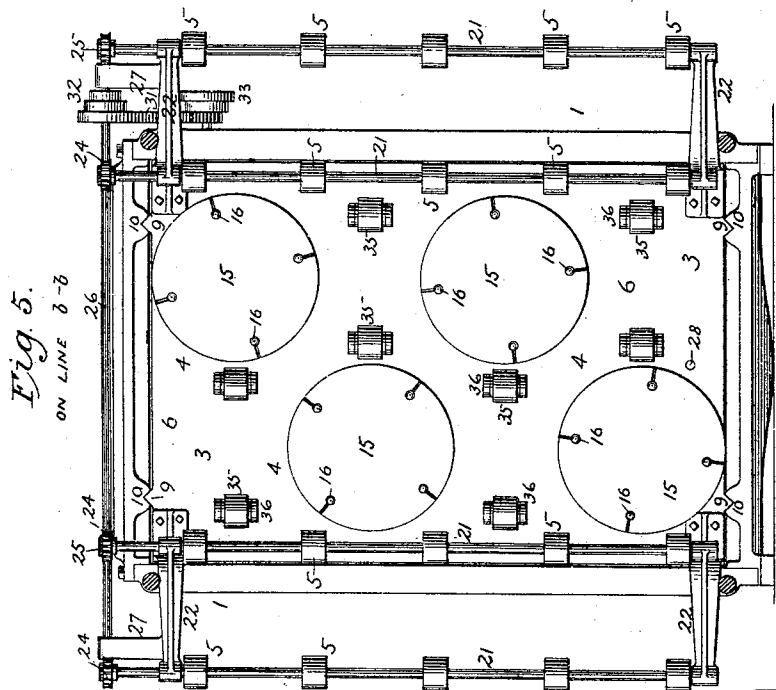
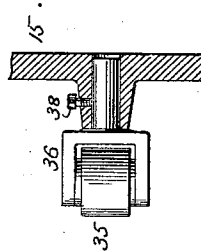
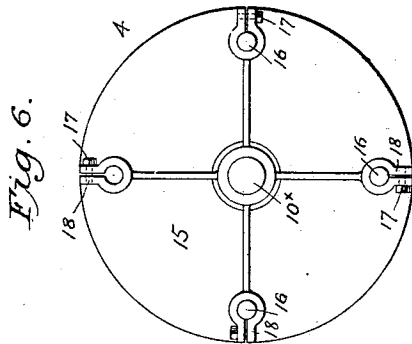
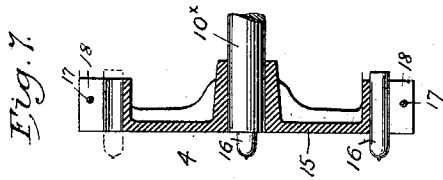
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No. 517,358.

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Sidney P. Hollingsworth
James J. Elmore

Inventor,

Aaron J. Nellis
by his attorney,
P. Y. Lodge

UNITED STATES PATENT OFFICE.

AARON J. NELLIS, OF PITTSBURG, PENNSYLVANIA.

GLASS-FINISHING MACHINE.

SPECIFICATION forming part of Letters Patent No. 517,358, dated March 27, 1894.

Application filed March 7, 1893. Serial No. 465,039. (No model.)

To all whom it may concern:

Be it known that I, AARON J. NELLIS, of Pittsburg, county of Allegheny, and State of Pennsylvania, have invented a new and useful
5 Improvement in Glass-Finishing Machines, of which the following is a specification.

My present invention has reference to a machine for grinding or finishing irregular surfaces, and is designed more particularly
10 for the treatment of glass, to remove the irregularities from the surface of the same and impart thereto a finish.

In an application for Letters-Patent of the United States filed by me on the 26th day of
15 November, 1892, Serial No. 453,348, is described and claimed a method of treating plate and other glass consisting in positively cutting or chipping away its surface by a cutting tool to bring the same to a general
20 level.

The present invention relates to a machine for quickly and effectively carrying out this manner of treating glass, and consists primarily of a mechanism embodying a series
25 of rapidly moving cutters adapted to act on the surface of the glass, and suitable supporting devices for the glass arranged to present the same so that the cutters may act progressively on its surface.

30 The invention also consists in so arranging the cutters with relation to the supporting mechanism for the glass that the latter will be presented in an upright position so that both sides may be subjected at the same time
35 to the action of the cutting tools.

The invention also consists in the details of construction and combination of parts hereinafter described and claimed.

In the accompanying drawings,—Figure 1
40 is a front elevation of a machine having my invention embodied therein, one side of the same being shown in section. Fig. 2 is a side elevation of the same. Fig. 3 is a top plan view of the machine. Fig. 4 is a horizontal
45 section on the line *a—*a** of Fig. 1. Fig. 5 is a vertical longitudinal section on the line *b—*b**. Fig. 6 is a front elevation of one of the cutter heads. Fig. 7 is a section through the same. Fig. 8 is a view of a detail.

50 Referring to the drawings,—the present invention embodies two rigid frames or castings 1, arranged side by side with a space

between them for the passage of the glass plate which is to be treated. These frames are suitably connected rigidly together by 55 cross bars at the top and bottom, and each sustains a relatively movable rectangular frame 3, in which are mounted mechanically rotating cutter heads 4 and their driving devices, and which sustain vertical feeding rollers 5, more fully described hereinafter, the arrangement being such that the cutter heads will act on opposite sides of the glass plate as it is advanced by the feeding rollers between them. As the frames 1, the relatively 65 movable frames 3, and the parts sustained thereby, are identical in all respects, a description of the said parts on one side of the machine will suffice for both.

The movable frame 3, consists of an inner 70 vertical plate 6, and an outer casting 7, which are connected rigidly at their upper and lower ends by transverse plates 8, which are provided with ribs 9, adapted to enter corresponding grooves or guides 10, formed in the frame 75 1, at the top and bottom, and extending transversely of the same, the construction being such that the frame 3, may be moved transversely with respect to its supporting frame.

The cutter-heads 4 are mounted on the inner 80 ends of horizontal shafts 10*, which are journaled near their inner ends in bearings 11, sustained by the vertical plates 6, and which have their outer ends mounted in bearings 12, in the ends of brackets 13, projecting 85 from the vertical plate. Each shaft is provided with a driving pulley 14, fixed thereto as shown. The cutter heads each consist of a flat disk 15, which is provided near its periphery with four sockets or openings adapt- 90 ed to receive and hold stocks 16, carrying at their ends carbons or black diamonds or other cutting points. The edge of the disk adjacent to the openings is provided with an incision extending inward and communicating 95 with the openings so that the sides of the latter may be clamped against the stocks which is effected by means of clamping-screws 17, extending through ears 18, projecting laterally from the face of the disk adjacent to the 100 incisions. In the present machine I employ four cutter heads on each side which are of such size and so arranged that the paths traversed by the four cutting points in each head

will overlap or extend beyond those of the adjacent cutters, so that every portion of the surface of the glass will be acted on as the latter is moved in contact with the cutters.

- 5 Motion is imparted to the cutters from any suitable source by a driving band 19, which extends around the driving pulleys, thence around an idler pulley 20, and finally upward to the source of power.
- 10 The feeding mechanism consists of eight vertical shafts 21, which are arranged in two vertical lines between the two parts of the machine in such manner that the glass to be acted on may be moved between them. These
- 15 shafts are mounted at their upper and lower ends in bearings carried by brackets 22, projecting from the vertical plate 6, and are provided at intervals throughout their length with collars 5, formed preferably of rubber or
- 20 equivalent soft material. At their upper ends the shafts are each provided with worm wheels 24, in position to be engaged by worms 25, fixed at intervals on a horizontal shaft 26, mounted in bearings in the ends of vertical
- 25 arms 27, extending from brackets 22. It will thus be seen that the cutter heads and the feeding mechanism are sustained by and movable with the vertical plates themselves. As a result of moving these plates inward or
- 30 outward as the case may be the distance between the two series of cutters and feeding rollers may be varied as the nature of the work may demand.

- For the proper operation of the machine it
- 35 is essential that these parts be adjusted to a nicety to the end that the cutters may act in the same general plane. In order, therefore, that this adjustment may be effected I provide the machine at both sides with a horizontal shaft 28, which has its outer end
- 40 mounted in a bearing at the outer side of the main frame, and has its inner end screw-threaded and engaging in a threaded opening in the vertical plate 6. The outer end of
- 45 the shaft is provided with a crank 29, by the rotation of which the frame 3 may be caused to move inward or outward according to the direction in which the crank is turned.

- To determine as to the relative positions of
- 50 the cutters and as to the probable space it is desired should exist between the cutters, I provide a fixed dial 30, which encircles the shaft 28, near its outer end and which is provided with a series of indicating points adapted to be read in connection with a pointer
- 55 carried by said shaft.

- Motion is imparted to the horizontal shafts 26, from the driving shafts of the upper cutter heads by a band 31, encircling a pulley
- 60 32, on the horizontal driving shaft and a pulley 33, on one end of the counter-shaft 34, mounted in bearings carried by the frame 3, the opposite end of said counter-shaft being provided with a worm wheel in position to be
- 65 engaged by the worm formed on the outer end of the driving shaft of the upper cutter head.

In order that the glass while being advanced by the feeding rollers and acted on by the cutters, may be prevented from jarring, 70 and may be held rigidly so far as any lateral movement of the same is concerned, I provide a series of pressure rollers 35, which are sustained by the vertical plates in such positions that they will be held in contact with 75 the glass plate. These rollers are mounted in frames 36, the ends of which are seated in sockets or collars projecting from the vertical plate 6, and fixed in said sockets by means of set-screws 38, as shown. By these means 80 the rollers may be adjusted so as to bear with the proper pressure on the plate under treatment.

In operating my machine the glass is introduced in an upright position between the 85 feeding rollers, and motion being imparted to the various parts of the machine, the glass is advanced between the rotating cutters which act on its two surfaces and cut the same so as to bring the surfaces to a general level. It 90 is to be understood, of course, that for the cutters, other abrading surfaces may be substituted, and that after the rougher irregularities have been positively cut from the surface of the glass, the latter may have im- 95 parted thereto a polish or finish by changing the nature of the abrading surfaces, substituting for the cutting tools the usual abrading or polishing heads.

As before stated the glass is advanced on 100 edge in an upright position, and is simultaneously subjected on both sides to the action of the cutters. This manner of feeding and treating the glass I deem of great importance as less time is consumed in the operation and 105 great saving of labor and expense effected. Further, it is possible to treat comparatively thin sheets of glass in this manner, where under the old manner of treatment of the sides separately, great danger existed in loosening 110 the glass from its bed to bring the opposite side upward.

I believe myself to be the first to treat glass plates by subjecting both sides at once to the action of grinding or polishing tools while the 115 plate is sustained on edge in an upright position.

It is evident that a single frame with a passage for the glass between the opposing cutters will be the mechanical equivalent of two 120 frames as shown, the expression two frames being used to include any structure in which the glass is permitted to pass between the cutters.

Having thus described my invention, what 125 I claim is—

1. In a glass finishing machine the combination of two series of opposing rotary cutters arranged in two vertical planes with a space between them, the cutters in each series 130 so arranged that the paths cut by the same will overlap in a vertical direction, and means for advancing the glass in an upright position between the cutters; whereby the cut-

ters are enabled to act on both sides of the glass at one time while the latter is in an upright position and will as the glass advances remove the irregularities from the entire surfaces of both sides of the same.

2. In a glass finishing machine the combination of a main frame having a horizontal passageway through it and provided at its top and bottom on each side of the passageway with transverse guides, two secondary frames mounted in said guides and adjustable independently toward and from each other, two opposing series of rotary cutters mounted in the secondary frames and acting in parallel planes, adjacent cutters in a vertical direction being journaled out of line with, and extending past, each other, means for advancing the glass plate between two series of cutters and means for driving the latter.

3. A cutter head for glass finishing machines comprising a flat disk having point holding sockets through it and slitted from said sockets through the periphery with projecting flanges around said sockets and along the slits, adapted to be drawn together to clamp and hold the cutting points.

4. In a glass finishing machine the combination with the main frame of the two transversely-movable frames provided with verti-

cal opposing plates, two series of cutters sustained by said plates and acting in parallel planes, two feeding rollers arranged to engage the opposite sides of the glass plate and advance the same between them, and pressure rollers mounted in the vertical plates between the cutters and adjustable back and forth, to bear on opposite sides of the glass plate.

5. In a glass finishing machine the combination with a frame, of a series of rotary cutters sustained thereby acting in a vertical plane and provided with horizontal driving shafts, vertical feed rollers, worm wheels on their upper ends, a horizontal shaft, worms on the shaft in position to engage the worm wheels, a pulley fixed to the horizontal shaft, a counter-shaft 34, a pulley fixed to one end, a driving band passing over said pulleys, a worm wheel on the opposite end of the counter-shaft, and a worm on one of the cutter driving shafts in position to engage the worm wheel on the counter-shaft.

In testimony whereof I hereunto set my hand, this 11th day of January, 1893, in the presence of two attesting witnesses.

AARON J. NELLIS.

Witnesses:

W. B. CRITTENDEN,
WALTER MCGURN.