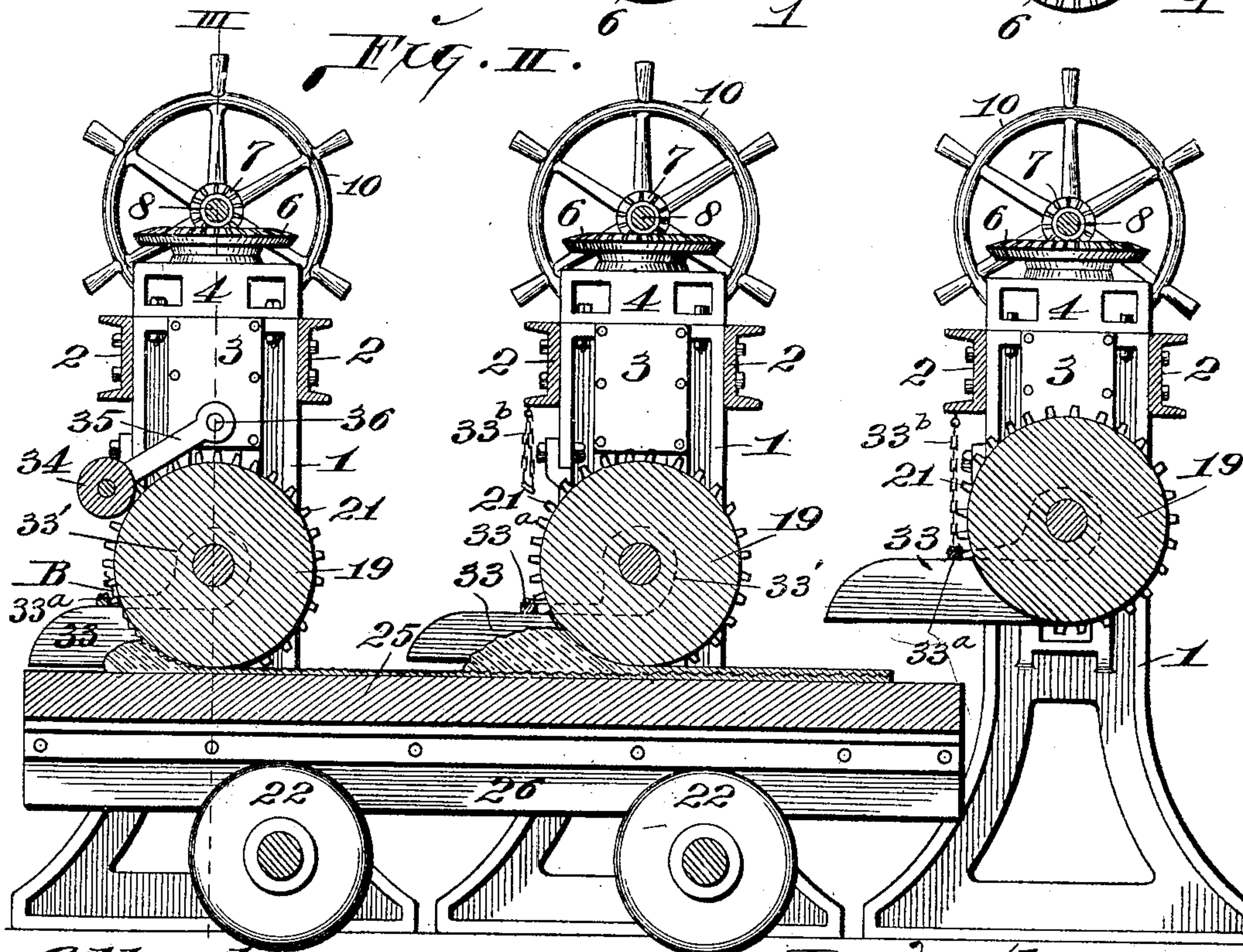
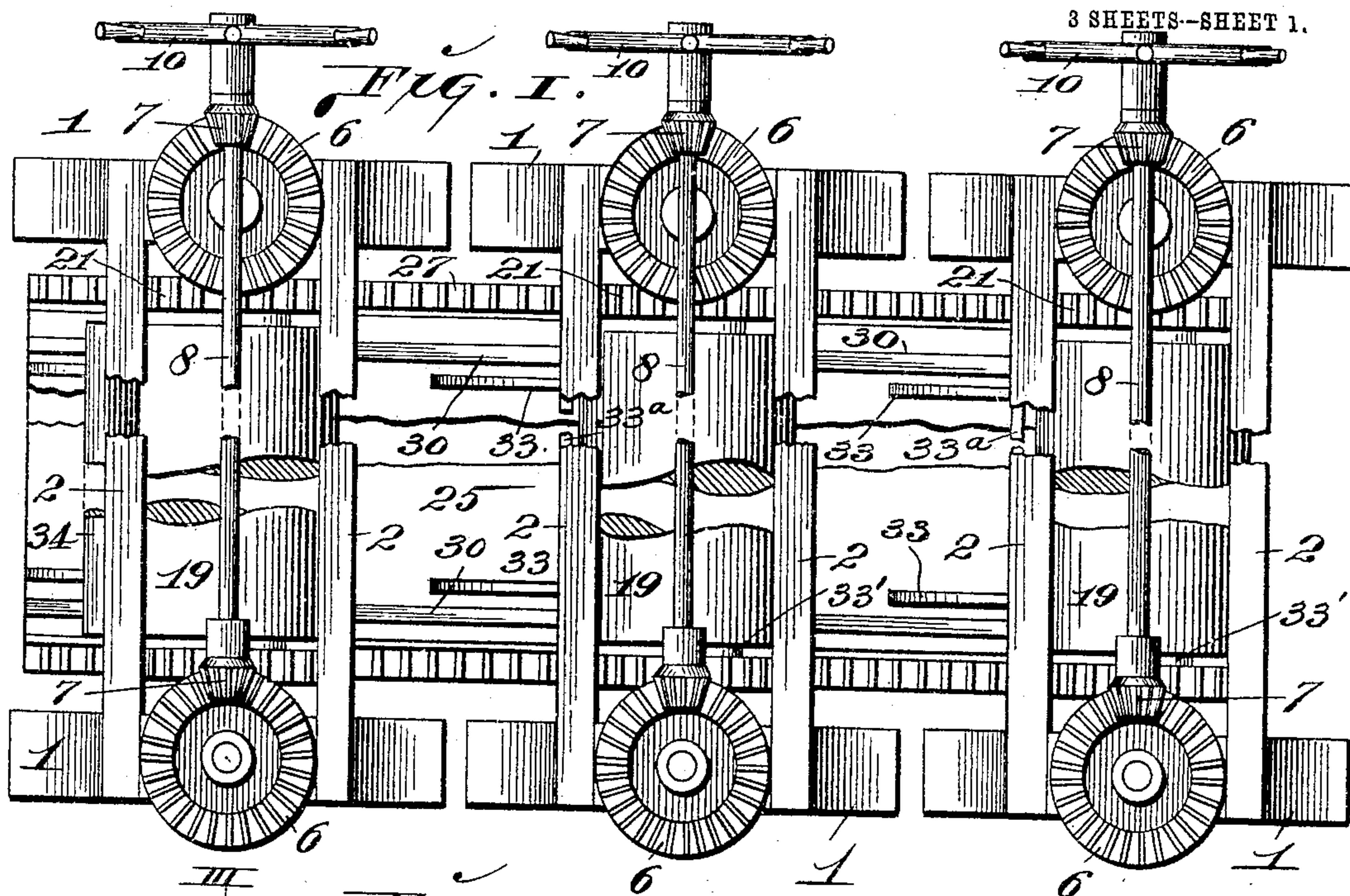


No. 805,657.

PATENTED NOV. 28, 1905.

A. MEYER.  
GLASS ROLLING APPARATUS.  
APPLICATION FILED OCT. 10, 1904.

3 SHEETS--SHEET 1.



Attest:  
M. Smith  
E. J. Knight

Inventor:  
Anton Meyer:  
By Thayer & Bro attys.

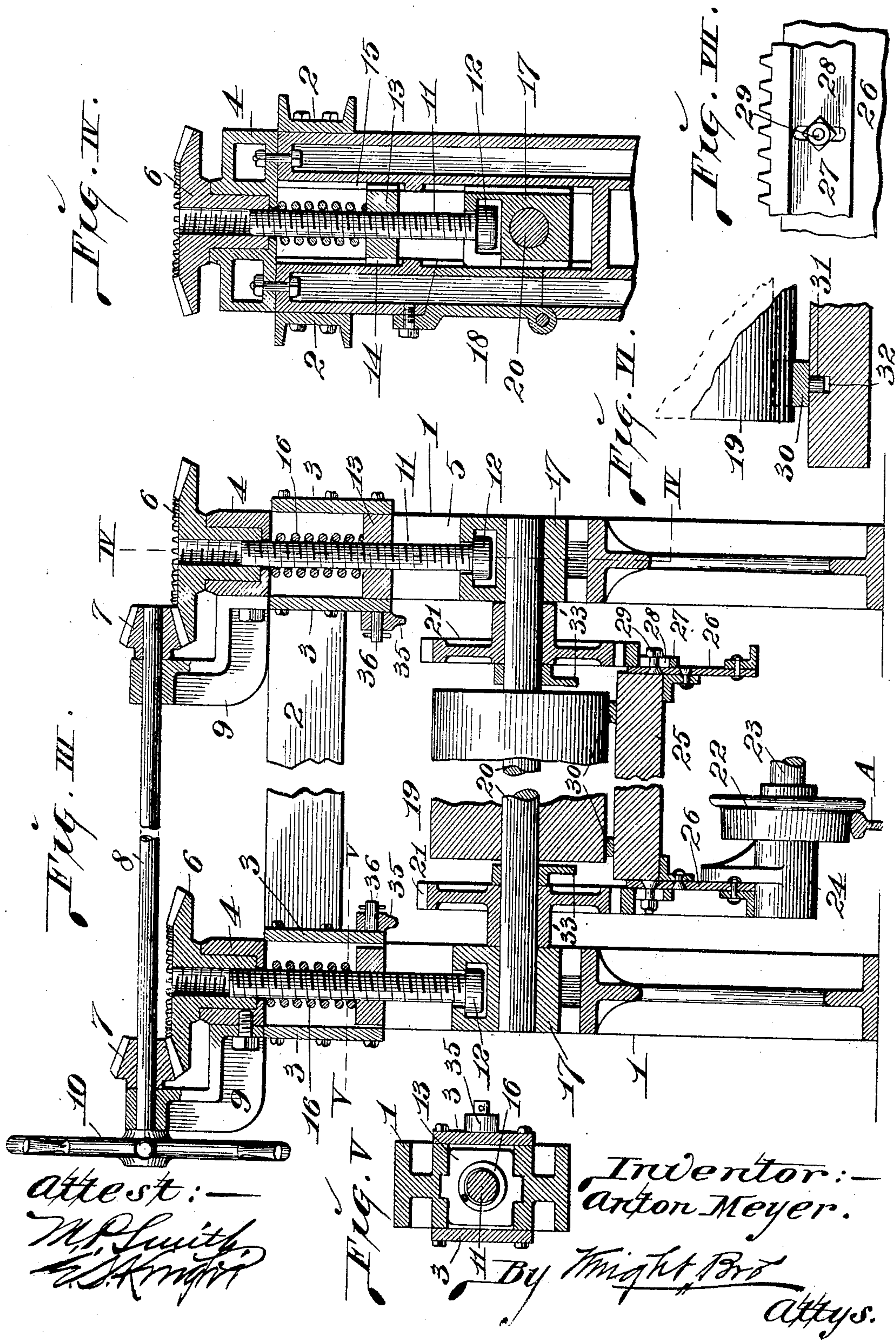


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3 SHEETS—SHEET 2.



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Fig. V

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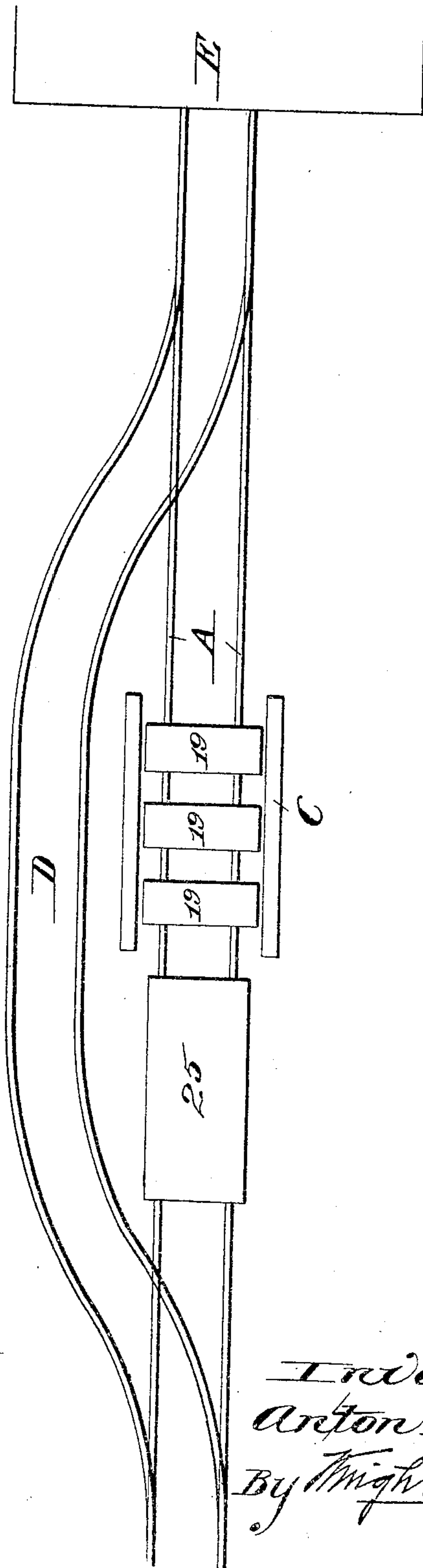
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3 SHEETS—SHEET 3.

*Fig. VIII.*



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# UNITED STATES PATENT OFFICE.

ANTON MEYER, OF ST. LOUIS, MISSOURI.

## GLASS-ROLLING APPARATUS.

No. 805,657.

Specification of Letters Patent.

Patented Nov. 28, 1905.

Application filed October 10, 1904. Serial No. 227,808.

*To all whom it may concern:*

Be it known that I, ANTON MEYER, a citizen of the United States, residing in the city of St. Louis, in the State of Missouri, have invented certain new and useful Improvements in Glass-Rolling Apparatus, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, forming part of this specification.

My invention relates to an apparatus for rolling glass, the apparatus being more particularly intended for use in rolling wire-glass, or glass having a layer of wire fabric embedded therein. The apparatus is, however, suitable for use in rolling plain sheet-glass.

Figure I is a top or plan view of my apparatus with parts broken out. Fig. II is a vertical longitudinal section of the apparatus. Fig. III is an enlarged vertical cross-section taken on line III III, Fig. II. Fig. IV is a vertical longitudinal section taken on line IV IV, Fig. III. Fig. V is a horizontal section taken on line V V, Fig. III. Fig. VI is a section taken through a portion of the carriage-table of the apparatus and one of the gages surmounting said table, a fragment of one of the rolls of the apparatus being shown in elevation surmounting said gage. Fig. VII is a view looking at a portion of one of the side edges of the carriage-table and one of the adjustable racks carried by said table. Fig. VIII is an outline plan view of a track and siding and my apparatus shown in connection therewith.

1 designates a series of standards that are arranged in pairs transversely of the apparatus, the various pairs of standards being united by tie-beams 2. Each standard 1 is bifurcated throughout its upper portion, the upper end of each post being partly closed by inner and outer side plates 3 and by a top bearing-cap 4. Beneath the side plates 3 the standards are open, as seen most clearly at 5, Fig. III.

6 designates bevel-pinions that are centrally bored and tapped and the shanks of which are journaled vertically in the bearing-caps 4 to rotate therein.

7 designates bevel-pinions meshing with the pinions 6 and fixed to a horizontal shaft 8, which is journaled in brackets 9, secured to the bearing-caps 4. The horizontal shaft is provided with a hand-wheel 10, by which it may be rotated to impart rotation to the pinions 6 through the medium of the pinions 7.

11 designates screw lift-rods that operate

vertically in the pinions 6 and which extend downwardly through the bifurcated portions of the standards 1 and are provided at their lower ends with heads 12. These lift-rods have fitted to them nuts 13, that ride within the standards 1 and are provided with tongues 14, which ride in vertical grooves 15 in the standards and serve to prevent rotation of said nuts when the lift-rods are operated therein. 16 are springs surmounting the nuts 13 and serving to hold them depressed.

17 designates vertically-movable boxes fitted in the open portions of the standards 1 beneath the nuts 13. These boxes are supported by the screw lift-rods 11, the heads of which are loosely seated in the boxes, as seen in Figs. III and IV. For the sake of convenience in the introduction of the boxes 17 into the standards I provide doorways in the walls of the standards, through which the boxes may be introduced, these doorways being closed by doors 18. (See Fig. IV.)

19 designates rolls, the shafts 20 of which are journaled in the boxes 17 to extend transversely of the apparatus between the pairs of standards 1. Each of the shafts 20 has fixed to it a pair of spur-wheels 21, one of said wheels being located adjacent to one end of each roll 19 and the other spur-wheel being located adjacent to the other end of said roll.

The rolls 19 and spur-wheels associated therewith occupy a sufficient elevation above a pair of carriage track-rails A to permit of the travel of a carriage on said rails beneath said rolls. This carriage is constructed as follows: 22 designates the carriage track-wheels, and 23 are the axles of said wheels, that are journaled in axle-boxes 24. 25 is the carriage-table, that is supported above the wheels 22 by side frames 26, secured to the axle-boxes 24. 27 designates rack-bars fitted to the carriage side frames 26 adjacent to the sides of the table 25, each rack-bar being provided with vertical slots 28, that receive clamp-bolts 29, seated in the side frames 26. Provision is thereby made for vertical adjustment of the rack-bars, which is readily accomplished by loosening the nuts of the bolts 29 and again tightening them after the rack-bars have been raised or lowered. The rack-bars are located immediately beneath the spur-wheels 21, which are arranged to mesh therewith to be rotated when the carriage is reciprocated to and fro on the track-rails A. (see Figs. I, III, and VI) designates gage-strips removably seated on the carriage-table



25, to which they are held by studs 31, that enter into the pockets 32 in the table. (See Fig. VI.) These gage-strips are made of varying thicknesses, according to the thickness it is desired to roll a sheet of glass, thin strips being used when a thin sheet of glass is to be rolled and thicker strips used when thicker sheets are to be rolled. 33 designates guard-plates that serve to restrict the outward spread of the glass being rolled upon the carriage-table 25. These guard-plates are supported by hangers 33', loosely mounted upon the roll-shafts 20 at the ends of the rolls, and cross-bars 33<sup>a</sup>, extending longitudinally of the roll. The cross-bars are provided with a plurality of pin-holes through which pins or screws are introduced and seated in the guard-plates, thereby providing for the adjustment of the plates to or from each other to vary the space between them according to the width of the sheet of glass being rolled. When any one of the rolls is in elevated position, the guard-plates may be supported by a suitable hanger, such as the hanger-chains 33<sup>b</sup>. (See Fig. II.)

34 designates a guide-roller that opposes the roll 19 at the receiving end of the apparatus and which is gravitatingly supported by arms 35, that are pivoted at 36 to the inner side plates 3 of the adjacent standards 1. This roller serves to direct the travel of the wire fabric as it enters the apparatus, as will hereinafter appear.

In the practical use of my apparatus in rolling sheet-glass with wire fabric embedded therein the fabric is passed over the roll 34 and downwardly between said roller and the adjacent roll 19 to the carriage-table 25. When the forward end of the carriage is brought into juxtaposition with the first roll 19 with which the guide-roller 34 is associated, a quantity of molten glass is placed on the table to be rolled thereon into a sheet as the carriage is moved forwardly. During such forward movement of the carriage the wire fabric (indicated by the letter B, see Fig. II) is drawn with the molten glass and pressed thereinto. As the carriage moves in the direction of one of the succeeding rolls a second quantity of molten glass is placed above the wire fabric previously rolled by the first roll, and this second quantity is rolled into a second layer above the wire fabric by the second roll 19, thereby embedding and inclosing the wire fabric. To accomplish the desired result, the first roll is lowered to a lower level than the second roll, as seen in Fig. II, so that the two layers of glass will be made one in a stratum surmounting the other. The rolls 19 are raised and lowered at will to produce the desired thickness of layers by manipulating the shafts 8 corresponding to the proper rolls through the medium of the hand-wheels 10, thereby imparting rotation to the bevel-pinions 7 and 6 and raising the boxes 17, in

which the roll-shafts are journaled. These boxes have the desired vertical movement imparted thereto by the turning of the screw lift-rods 11 in the pinions 6 and the nuts 13. The thickness to which the sheet of glass is to be rolled is readily governed by the introduction of the gage-strips 30 of varying thicknesses, according to the thickness of the sheet of glass it is desired to produce, and these gage-strips being located on the carriage-table immediately beneath the rolls the rolls will travel thereupon and cannot operate to produce a sheet of less thickness than that desired. When a change is to be made to produce a sheet of glass of different thickness from that previously produced, the proper gage-strips are placed upon the carriage-table in lieu of those previously used, and to compensate for the necessary elevating or lowering of the rolls 19 the rack-bars 27 are raised or lowered, so that they will mesh properly with the spur-wheels 21 opposing them. In the drawings I have illustrated a set of three rolls 19; but it is apparent that two rolls only or any other number greater than three may be made use of, the two rolls being sufficient for the accomplishment of the desired result. I prefer to use three or more rolls for the reason that when one of the rolls becomes abnormally heated in operating upon the molten glass it may be elevated and placed out of service to cool while the other rolls are being utilized. When a sheet of glass has been rolled on the carriage, the carriage is conveyed to an annealing-oven in which the sheet of glass is annealed as a finishing step.

While I have described my apparatus as used in the production of wire-glass, it is obvious that it may be made use of to roll plain sheet-glass by simply omitting the step of embedding wire fabric into the sheet. When the apparatus is so used, a single roll or any greater number of rolls may be utilized.

In Fig. VIII, I have shown in outline a track, a portion of an annealing-oven, and my apparatus associated therewith. In this view, A is the main-track rails, and D a siding leading therefrom and thereto. C is the rolling portion of my apparatus, the carriage with its table 25 being shown upon the main-track rails. E is an annealing-oven to which the glass is conveyed on the carriage after it has been rolled. When the carriage has been placed in the annealing-oven and withdrawn therefrom, it is transferred onto the siding D, where the finished sheet of glass is removed, and the carriage is then brought back to again enter the rolling portion of the apparatus, as before, for the process of rolling the next sheet of glass.

I claim as my invention—

1. In a glass-rolling apparatus, the combination of a table, a series of rolls surmounting said table, means for rotating said rolls, standards in which said rolls are mounted, a



guide-roller associated with one of said rolls and occupying a position above the axis of the roll, and means whereby said guide-roller is gravitatingly connected with a pair of said standards in which said last-named roll is mounted, substantially as set forth.

2. In a glass-rolling apparatus, the combination of a reciprocating carriage having a table, rolls surmounting said table and geared to said carriage, and guard-plates carried by the shafts of said rolls and hanging suspended above said table, substantially as set forth.

3. In a glass-rolling apparatus, the combination of a table, rolls surmounting said table, guard-plates located adjacent to said rolls, means whereby said guard-plates are adjustably supported; said supporting means consisting of hangers mounted upon the shafts

of said rolls, and cross-bars to which said guard-plates are adjustably fitted, substantially as set forth.

4. In a glass-rolling apparatus, the combination of a table, a series of rolls surmounting said table, means for rotating said rolls, standards in which said rolls are mounted, links pivoted to one pair of said standards and a guide-roller gravitatingly supported by said links in a position above the axis of the adjacent roll mounted in the standards to which said guide-roller is connected, substantially as set forth.

ANTON MEYER.

In presence of—

E. S. KNIGHT,  
NELLIE V. ALEXANDER.