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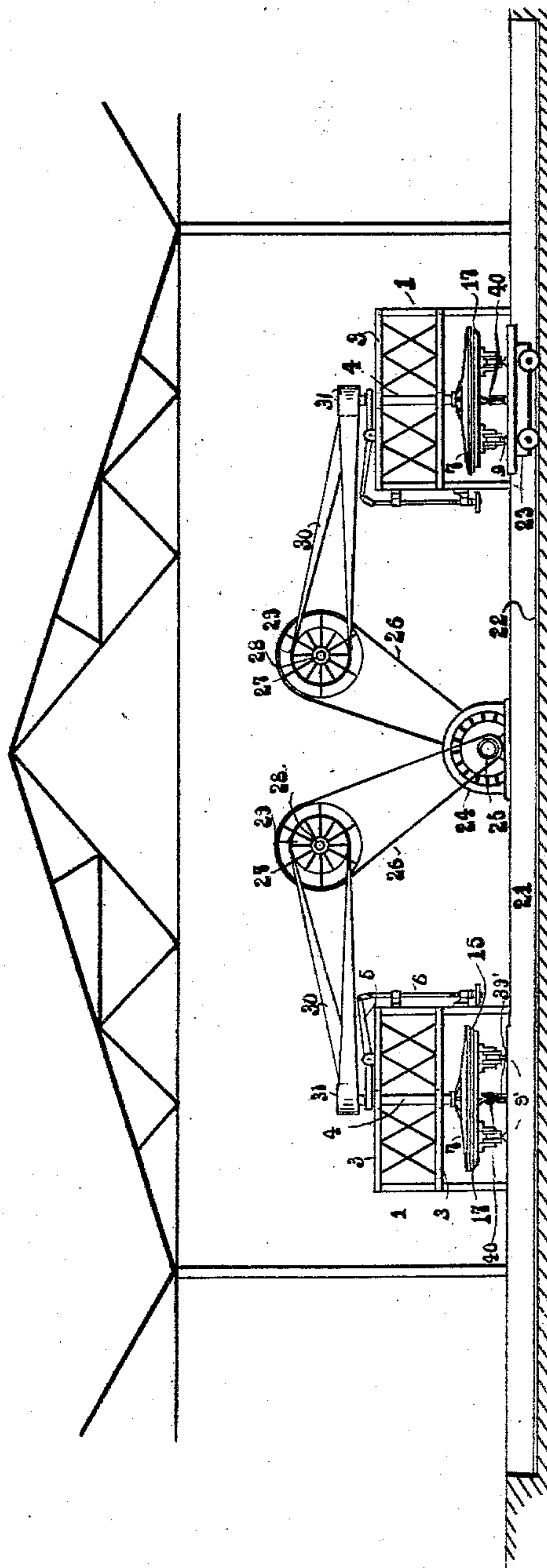
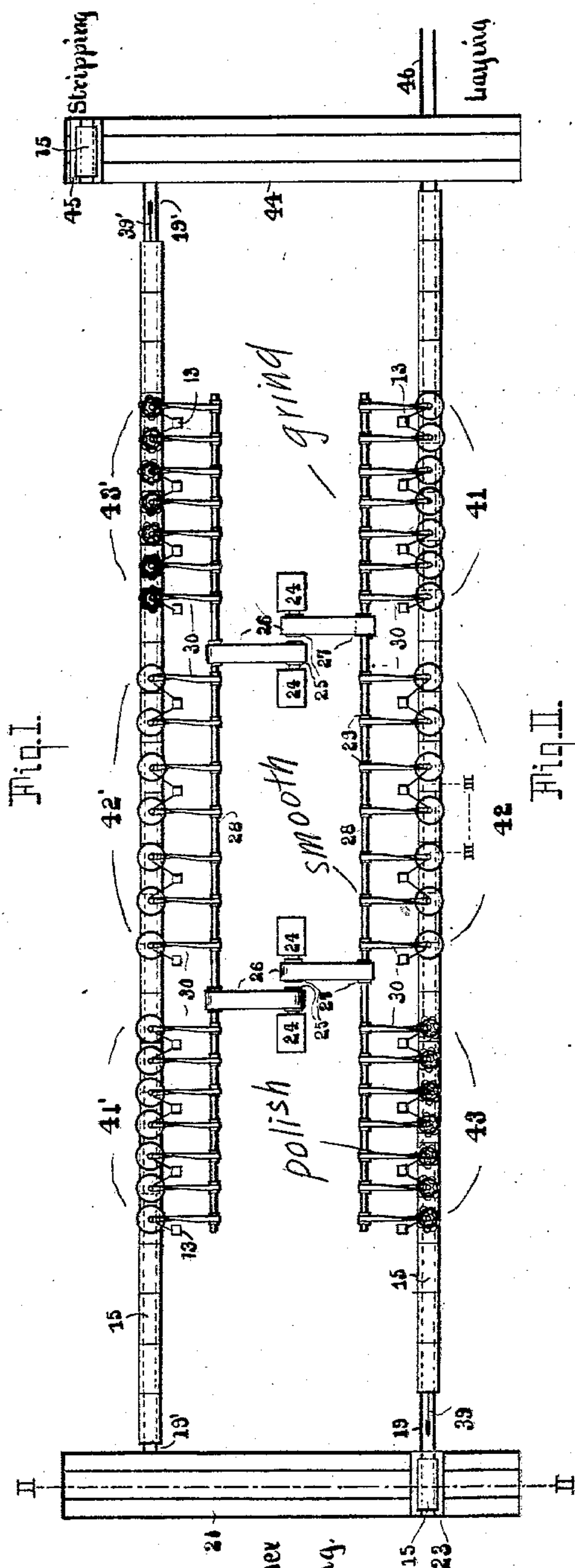
PATENTED OCT. 6, 1903.

F. S. BROCKETT.
MACHINE FOR SURFACING PLATES OR SHEETS.

APPLICATION FILED SEPT. 12, 1900.

NO MODEL.

3 SHEETS—SHEET 1.



WITNESSES

Geo. H. Harvey.
M. M. Caskey.

Turning over
and
relaying.

INVENTOR

Frank S. Brockett,
Per his atty, Wm. L. Pierce

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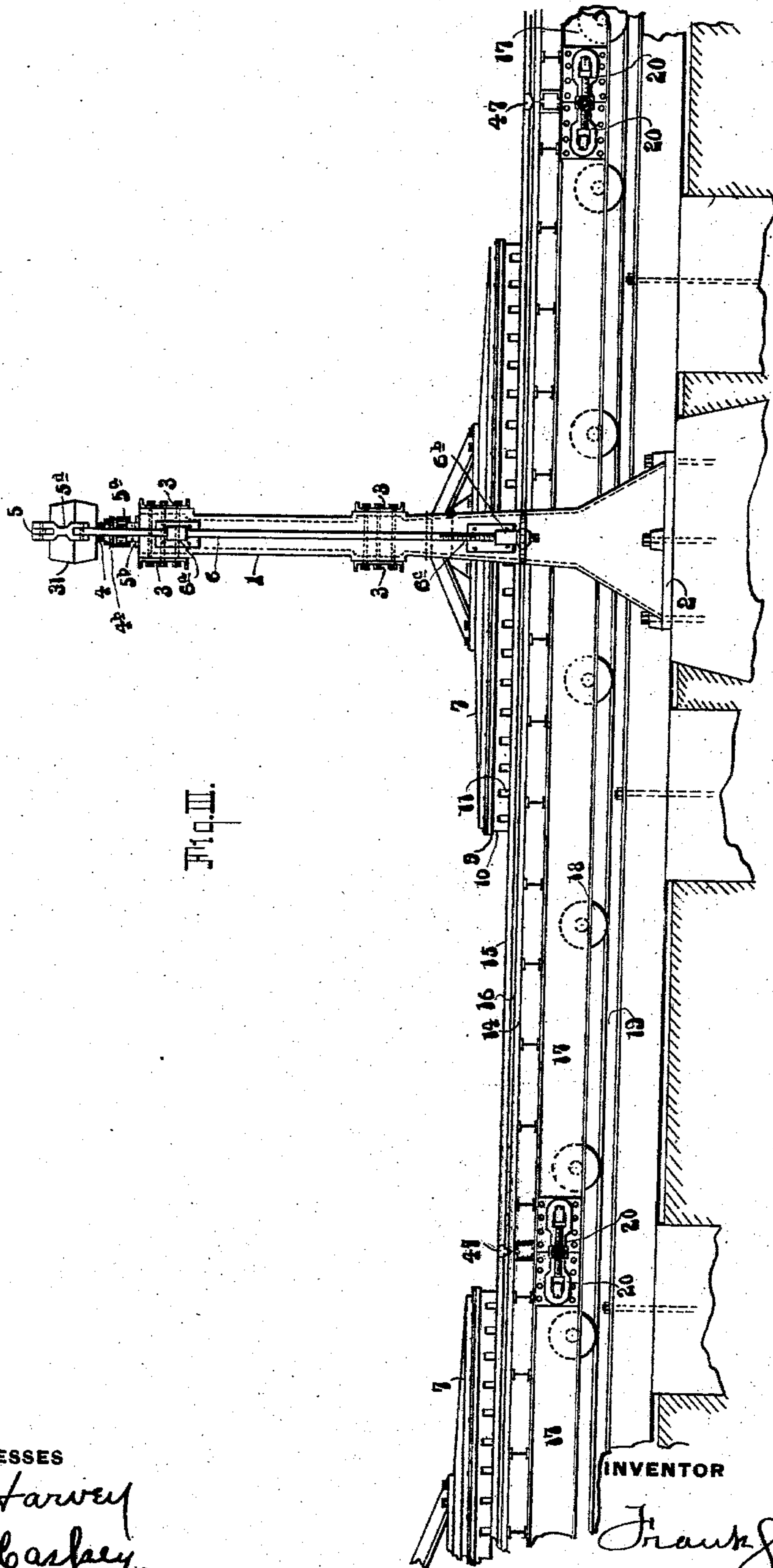
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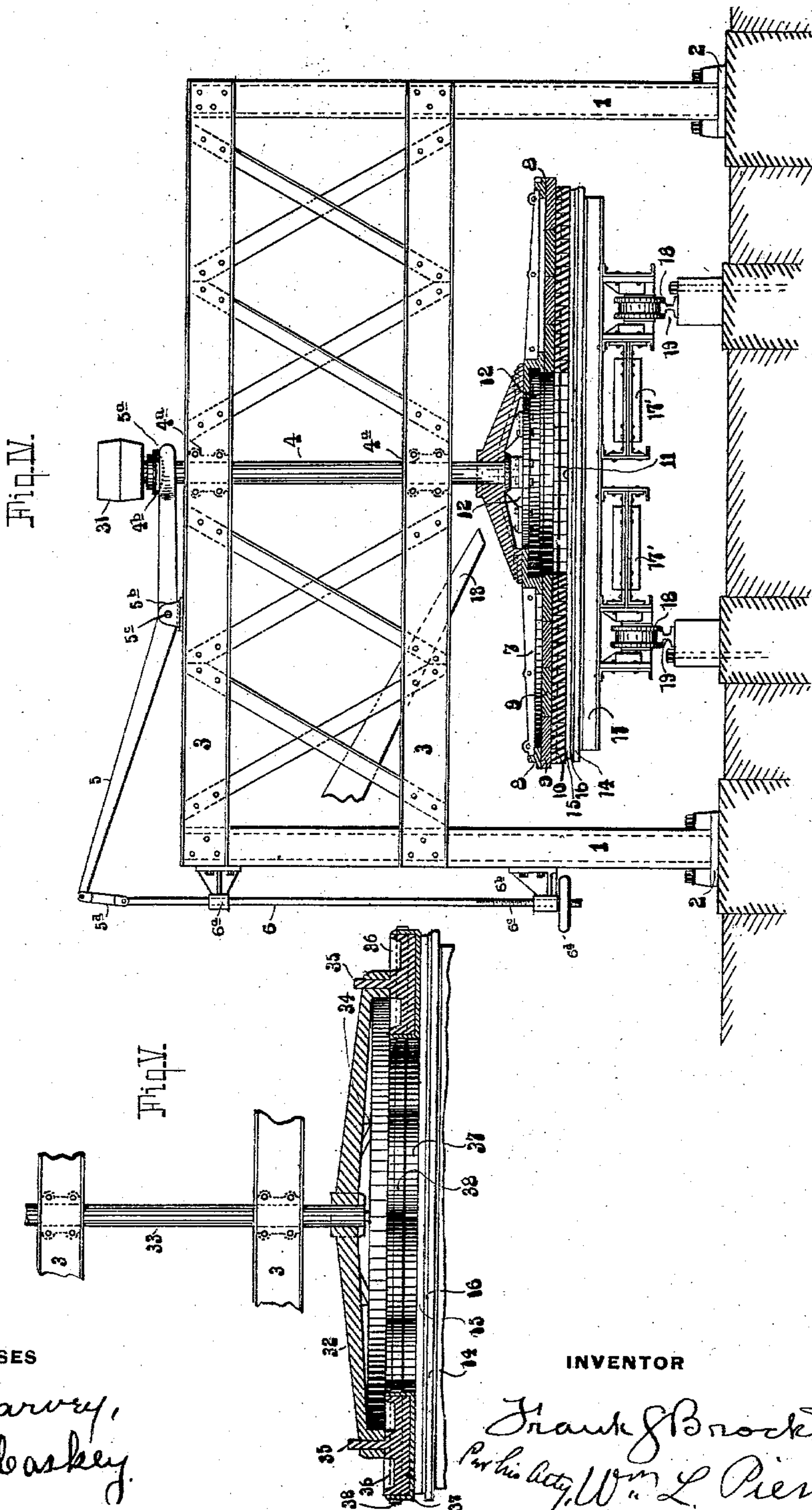
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3 SHEETS—SHEET 3.



WITNESSES

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UNITED STATES PATENT OFFICE.

FRANK SHELTON BROCKETT, OF PITTSBURG, PENNSYLVANIA.

MACHINE FOR SURFACING PLATES OR SHEETS.

SPECIFICATION forming part of Letters Patent No. 741,001, dated October 6, 1903.

Application filed September 12, 1900. Serial No. 29,801. (No model.)

To all whom it may concern:

Be it known that I, FRANK SHELTON BROCKETT, a citizen of the United States, residing at Pittsburg, in the county of Allegheny and State of Pennsylvania, have invented or discovered new and useful Improvements in Machines for Surfacing Plates or Sheets, of which the following is a specification.

In the accompanying drawings, which make part of this specification, Figure I is a plan view of the general arrangement of the glass-plate grinding, smoothing, or polishing devices. Fig. II is a vertical end section on line II II of Fig. I. Fig. III is a detail side elevation on line III III of Fig. I. Fig. IV is an end view of the columns supporting grinding device and showing the runner in vertical cross-section. Fig. V is a detail side elevation, partly in section, of a runner, showing the polishing-blocks.

Heretofore in the manufacture of plate-glass after the sheets have come from the leers they are taken to the grinding department, then to the rubbing-frames, then to the polishing department, then trimmed and put in the racks.

More specifically, the manipulation of the sheets has been thus: When a sheet comes to the grinding department, it is embedded in plaster, so as to be held firm while acted on by the grinder. The grinder is a disk having a series of runners on the under side adapted by the use of suitable abrasives to grind and smooth the surface of the plate. These grinders are of great weight, being of large diameter, and require expensive foundations and must run at a slow speed. After the plate is ground with coarse sand the sand is washed off and finer sand fed in, and so on down through various grades of fineness of sand and subsequently of emery. After one side of the plate has thus been ground and smoothed the plate is taken out of the plaster, turned over, relaid in plaster, and similar work done on the other side by the same grinder and at the same bench. In these operations a plate which was cast one-half an inch thick is brought down to a quarter-inch thickness before it is taken from the first bench to what is known as the "rubbing-frames" department. In the rubbing-frames one side of the plate is rubbed or cleaned to

permit of a careful inspection for vents or nicks, as it would be dangerous to handle the thin plate with such defects on its edge, as in carrying the plate such vents would start cracks which might shatter the sheet. The plate is then turned over and the other side similarly cleaned and scrutinized. All four sides of the plate are then trimmed, the trimming extending from an inch in width inward, depending on the condition of the edges. The plate now goes to a third department, called the "polishing" department. The polishers, as well as the grinders, are also of great size, as they must reach in their movements from end to end, as well as from side to side, of the sheet. Here it is again laid in plaster under the polisher and polished on one side by felt blocks. After one side is polished the plate is freed from the plaster, turned over, reset in the plaster, and the other side likewise polished. The plate is then removed from the plaster, retrimmed, and put in the racks. This method of operation just outlined requires three crews—one at the grinder, one at the rubbing-frames, and one at the polishing department. Furthermore, at least six handlings of the plate are involved, most of which are performed after the plate has been reduced to a quarter-inch in thickness. The system thus outlined is unsatisfactory for the following reasons, among others: First, the great size and weight of the grinders make them very expensive themselves and they also require heavy and costly foundations; second, the size and weight of the grinders keep down the output, since the grinders cannot be speeded up; third, the labor cost, owing to the repeated handlings and embedding of the plate, is excessive; fourth, the numerous handlings increase greatly the percentage of breakage, and especially upon the largest sheets, which are the most valuable; fifth, the repeated handlings necessitate a preliminary as well as a final trimming; sixth, the operation is not continuous in any proper sense.

I propose by my invention to minimize some of the foregoing disadvantages and abolish others, or, to be more specific, I provide a series of light-weight consecutive grinders smoothers, or polishers which may be run at

a high speed, thus multiplying the output and reducing cost of grinders and foundations. I reduce the labor bill about one-half, requiring only two crews, reduce the handlings to one-third the number ordinarily required and the percentage of breakage in the same ratio, set the plate twice only instead of four times in plaster, trim once only, and make the process continuous from the leers to the racks. In accomplishing these results I prefer to use the following mechanism:

1 1 are columns resting on piers 2 2. These columns are connected together in pairs by girders 3 3, forming a series of stationary supports for the vertical shafts 4 4. Said shafts have their vertical bearings in quarter-boxes 4^a 4^a and horizontal bearings by means of conical collars 4^b 4^b, revolving on the clutch-arms 5^a 5^a of the friction-lever 5. Bolted to girder 3 3 are forked bearing-blocks 5^b 5^b.

5^c 5^c are pins securing blocks 5 5 to forked blocks 5^b 5^b and act as the fulcrums for said levers. Loosely connected to the outer ends of levers 5 5 are forked bars 5^d 5^d. These bars are also connected to the upper ends of bars 6 6. They form the swivel connection between said levers 5 5 and bars 6 6. 6^a and 6^b are vertical bearings for bar 6, and male threads 6^c are formed on the lower ends of bars 6 6. Wheels 6^d 6^d have corresponding female threads which engage the male threads 6^c 6^c. By revolving the wheels 6^d 6^d to the right they would bear against the bearings 6^b 6^b, causing the bars 6 6 to pull down on the outer ends of levers 5 5, and through pins 5^c 5^c raise the clutch-arms 5^a 5^a, imparting a vertical lift on the shafts 4 4. These raising and lowering devices are very useful in regulating the amount of friction required by the runners on the plates.

7 7 are the frames of the runners used in the grinders 41 41 41' 41' and smoothers 42 42 and 42' 42'. These runners have oak planks 9 9 or their equivalents bolted to the under side of the flanged projections 8 8. Runner-bars 10 10 are secured to the bottoms of the oak planks 9 9. These runner-bars have serrated faces 11 11.

12 12 are openings through the center of the runners.

13 13 are conveyers for the grinding material, which flows through the openings 12 12 upon the plates and into the serrations 11 11, causing a wearing away of the roughened surfaces of the plates. Plates 15 15 are attached to tables 14 14, preferably by means of plastic cement 16 16.

17 17 are carriages mounted on the trucks 17' 17'. Wheels 18 18 are housed in suitable bearings on said trucks.

19 19 are tracks located under the runners and over which the tables 14 14 are moved. There are various means by which the tables 14 14 can be moved under the runners in a continued succession. Preferably I show the tables 14 14 mounted on wheeled carriages 17 17, receiving their motive power by means

of endless cables 39 and 39', revolving under the trucks of the carriages 17 17 and between the pits 21 and 44. The carriages 17 17 are connected to the cables 39 and 39' by means of grips 40 40.

20 20 are couplings for connecting together the carriages 17 17.

21 and 44 are pits in which pit-cars 23 and 45 move in a transverse direction to the line of travel of carriages 17 17.

24 24 are motors supplying power to the runners by means of pulley-wheels 25 25, belts 26 26, pulleys 27 27, shafts 28 28, pulleys 29 29, belts 30 30, pulleys 31 31, and vertical shafts 4 4.

In the series of polishers 43 43 and 43' 43' are shown runners 32 32, connected to the ends of shafts 33 33. As shown in Fig. V, said runners are constructed of an open ribbed frame 34. Connected to the outer rim of the runners 32 32 by means of rotating shafts 35 35 are polishing-blocks 36 36. These blocks are rigidly secured to shafts 35 35 and have stretched across their faces squares of felt 37 37. Said felt partly covers the sides of the polishing-blocks 36 36 and is retained in position by means of wedging-rings 38 38.

By referring to Fig. I the general plan of arranging preferably the runners, carriages, and transverse ways is shown. At the position marked "Laying" carriage 17 would rest on pit-car 45 and the operation of securing a crude sheet of glass 15 or like material on the table 14 be performed. Pit-car 45 is then pushed to a line with track 19 and carriage 17 is moved off of said car to track 19. The operator then attaches the grip 40 to cable 39, which moves carriage 17, carrying plate 15, forward continuously first under the horizontal rotating grinders 41. These grinders are supplied with a mixture of coarse sand and water from conveyers 13 13. While the plates are passing under the grinders 41 the rougher portions of the serrated face exposed are removed.

42 represents a series of smoothers under which the plate next passes. These smoothers 42 are supplied with a mixture of fine sand, emery, and water through like conveyers 13 13. The plate after passing from under the operation of the smoothers 42 passes under the polishers 43. A mixture of rouge and water is supplied to the polishers 43. These polishers give the final or desired polish or finish to the side of the plate exposed. After the plate 15 has passed from under the polishers 43 grip 40 is released from cable 39. Pit-car 23 is then moved in a line with track 19 and carriage 17 is pushed onto said car.

At the position marked "Turning and relaying" the pit-car 23 is stopped and plate 15 is detached from table 14, turned over, and relaid on the table 14 with the finished side down. Pit-car 23 is then pushed to track 19'. Carriage 17 is transferred to track 19' and grip 40 attached to cable 39', which moves

the carriage 17, carrying plate 15, forward and under the grinders 41', smoothers 42', and polishers 43', where the operations are similar to the action on the reverse side of the plate 15 by the grinders 41, smoothers 42, and polishers 43. The plate being now finished, grip 40 is released from cable 39' and the carriage 17 moved onto pit-car 45, and said car is pushed to position marked "Stripping," where the plate 15 is detached and lifted from the table 14. The plate is then prepared for storing or shipping. Pit-car 45, carrying carriage 17, is pushed to the first position, marked "Laying," and the former operations repeated.

In Fig. III, I show more clearly the arrangement of the tables in a connected series. Preferably a sufficient number of carriages 17 17 are provided to form a continuous line in tandem of tables 14 14. When the plant would be first put into operation, these carriages would receive the plates 15 15 while on track 46 and be transferred to track 19 by crossing pit-car 45; but after the required quota of carriages 17 17 were on the tracks 19 and 19' the transferring back to the laying position from the stripping position would be similar to the described moving of the single carriage 17. The first carriage transferred from track 46 to track 19 would be attached to the cable 39 by means of grip 40, and the following carriages 17 17 would be also attached to the cable and coupled together, preferably by means of the couplings 20 20, to the preceding carriage, although each carriage could be independent of the others. The open spaces between the plates 15 15 at the end of the tables 14 14 are filled with a plastic cement 47 47, flush with the tops of the plates, so that an uninterrupted surface is exposed to the runners. While the endless cable 39 is moving the tables forward under the runners the operations of grinding, smoothing, and polishing the glass are as be-

fore described. The unbroken surface presented to the runners increases the quantity of plate being operated on, lessens the cost of handling, and expedites the output.

In the drawings and description of the operative mechanism shown above the tables are referred to as preferable in illustrating successful means for grinding, smoothing, or polishing plates by arranging rotating runners in a line with the continuous movement of the plate in one direction. To those skilled in this art various movements would suggest themselves, such as lateral, reciprocating, rocking, or universal, oscillating or non-rotary runners having a transverse or forward or a transverse and forward movement; but such means would be applicable to and form a part of my invention when used in connection with the continuous movement of the plate in one direction.

Having described my invention, what I claim is—

1. In a plant for surfacing sheets, the combination of two tracks, a series of runners mounted above each of said tracks, cross connections between said tracks, and cars mounted on the main tracks and the cross connections.

2. In a mill design for surfacing sheets, the combination of two tracks, a series of runners mounted above each of said tracks, cars adapted to run upon said tracks, sunken cross-tracks connecting the two aforesaid tracks and provided with cars adapted to receive and transfer the cars from one to the other of said first-mentioned tracks.

Signed at Pittsburg this 5th day of September, 1900.

FRANK SHELTON BROCKETT.

Witnesses:

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M. W. CASKEY.