(No Model.) 6 Sheets—Sheet 1.

J. W. BONTA.

APPARATUS FOR ROLLING PLATE OR SHEET GLASS.

No. 462,528. Patented Nov. 3, 1891.

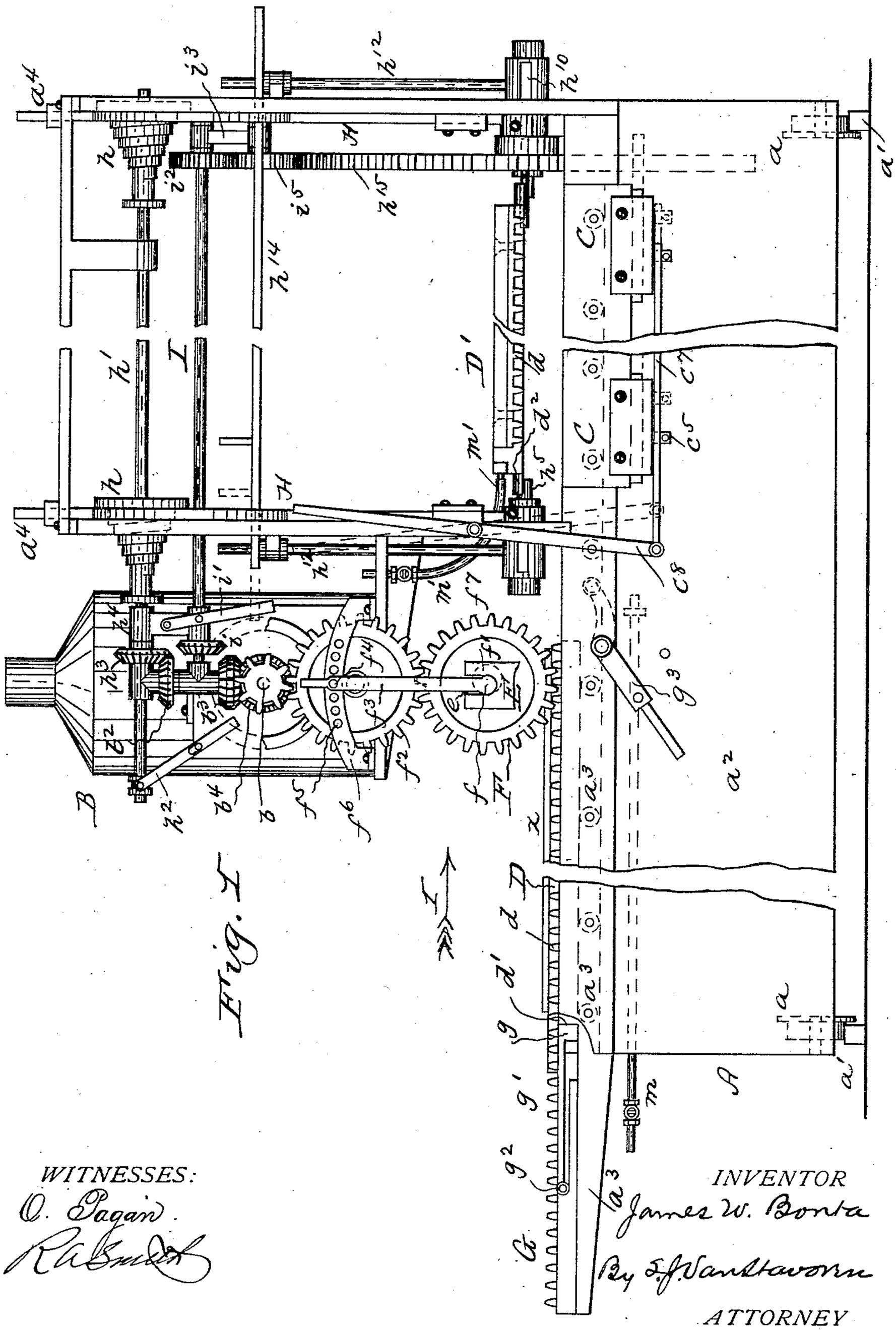

Fig. 1.

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(No Model.) 6 Sheets—Sheet 2.

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APPARATUS FOR ROLLING PLATE OR SHEET GLASS.

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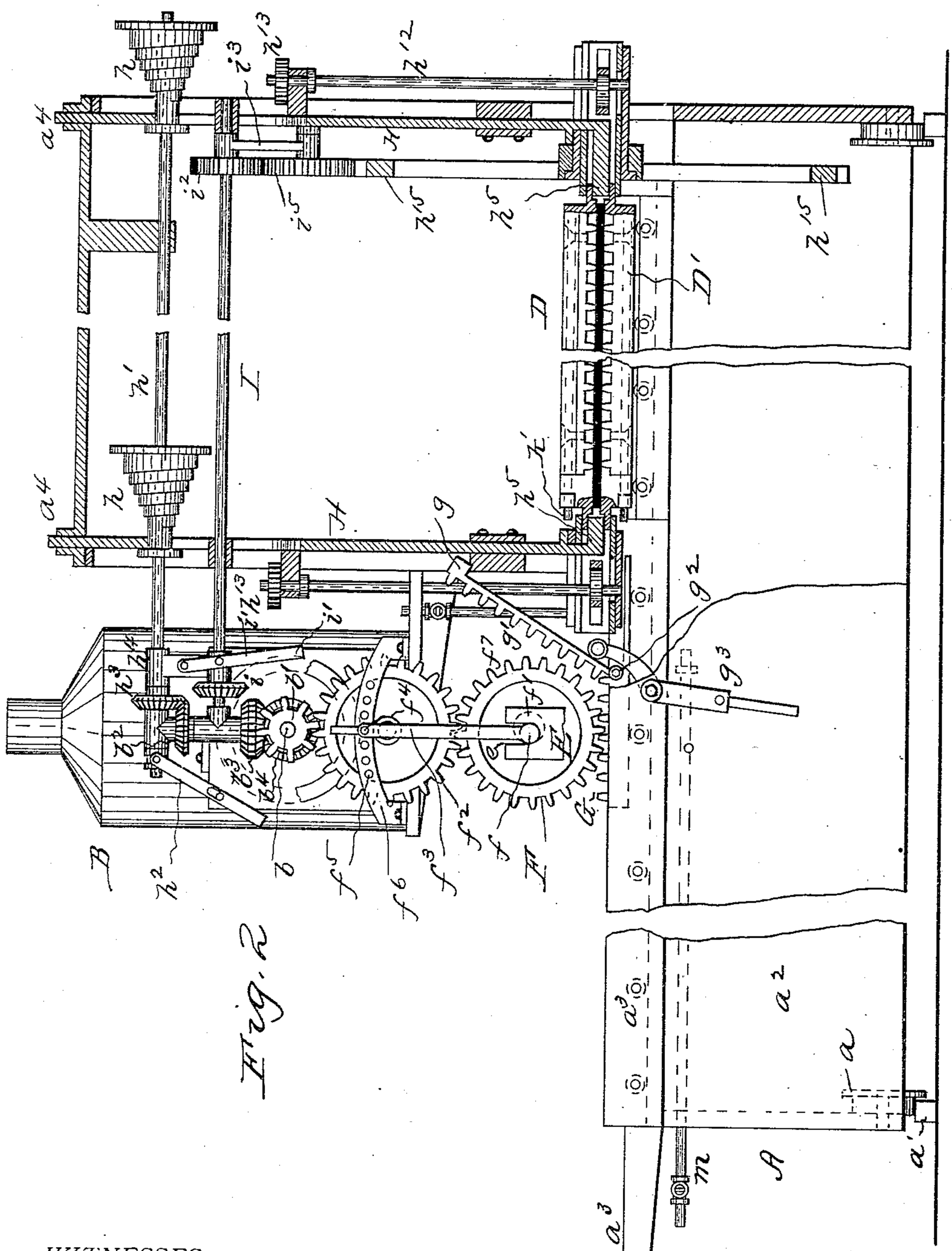

Fig. 2.

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(No Model.) 6 Sheets—Sheet 3.

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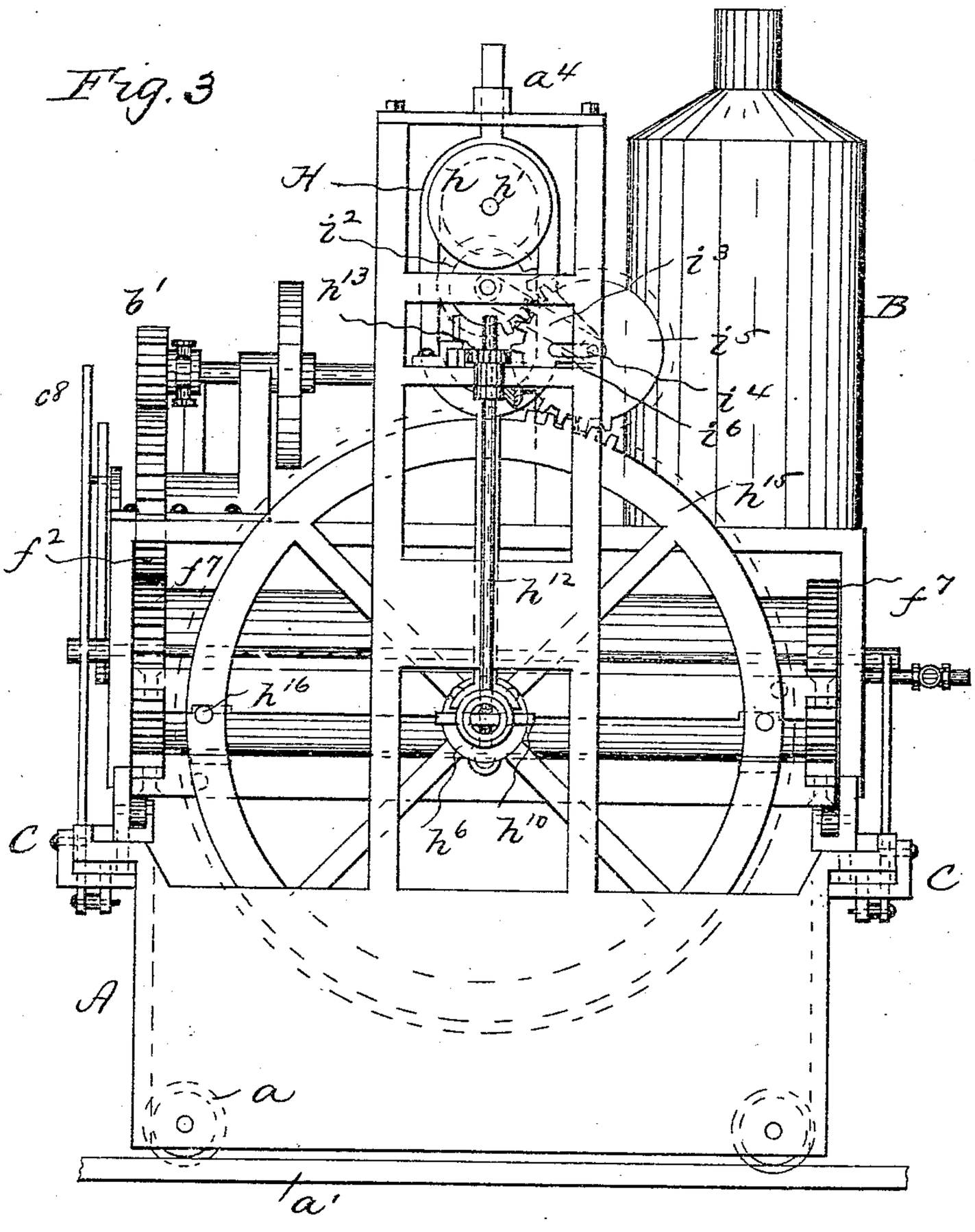
APPARATUS FOR ROLLING PLATE OR SHEET GLASS.

No. 462,528. Patented Nov. 3, 1891.

Fig. 3



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(No Model.) 6 Sheets—Sheet 4.

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APPARATUS FOR ROLLING PLATE OR SHEET GLASS.

No. 462,528. Patented Nov. 3, 1891.

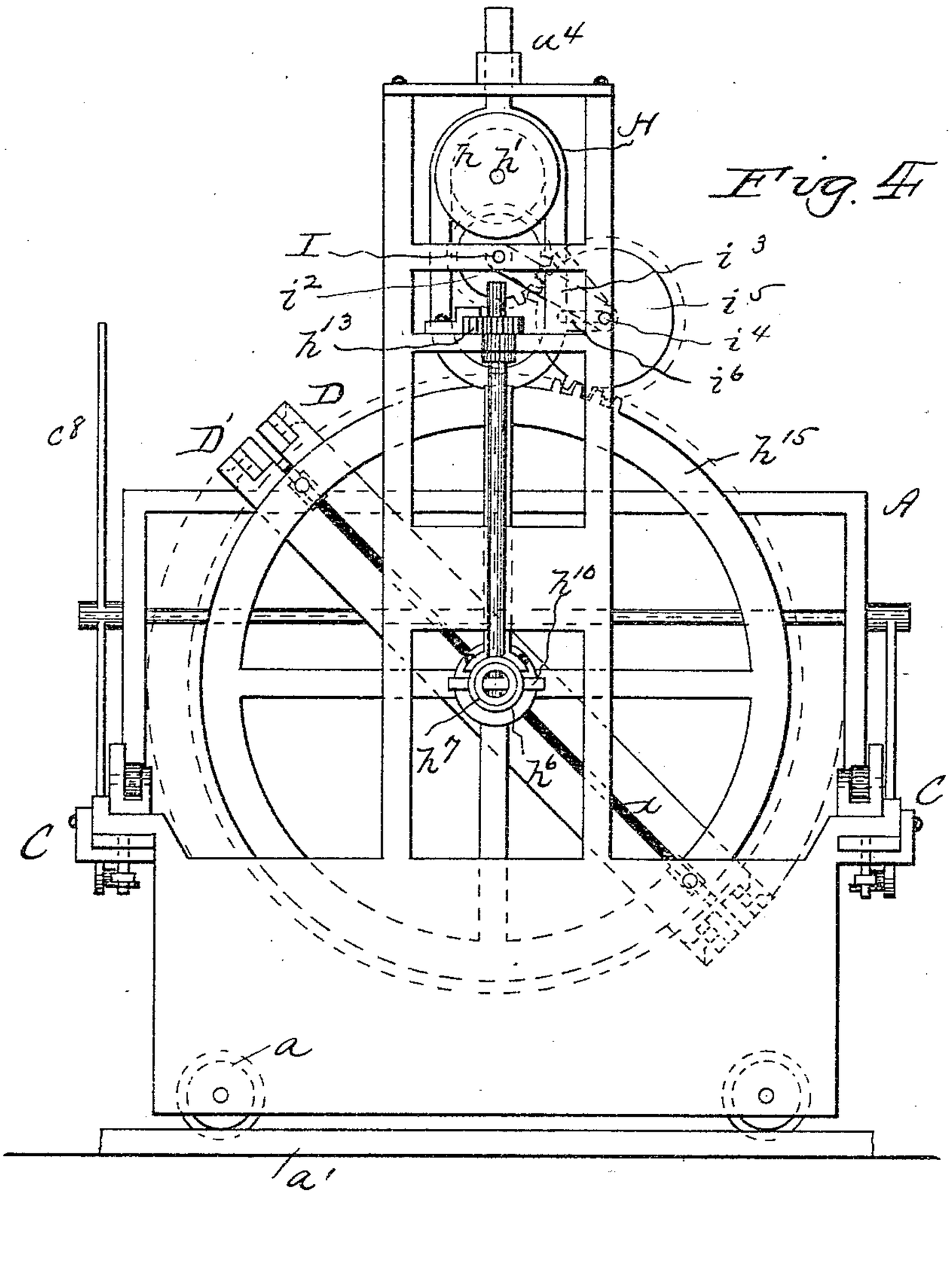

Fig. 4

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(No Model.) 6 Sheets—Sheet 5.

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APPARATUS FOR ROLLING PLATE OR SHEET GLASS.

No. 462,528. Patented Nov. 3, 1891.

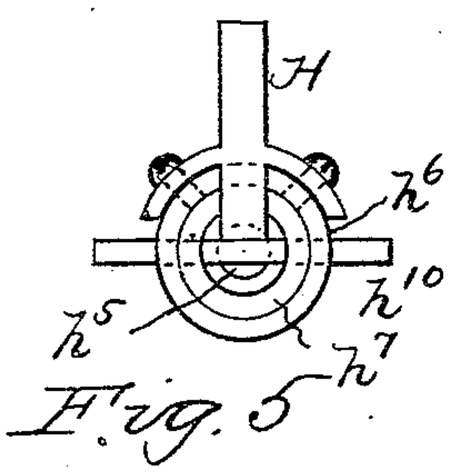

Fig. 5

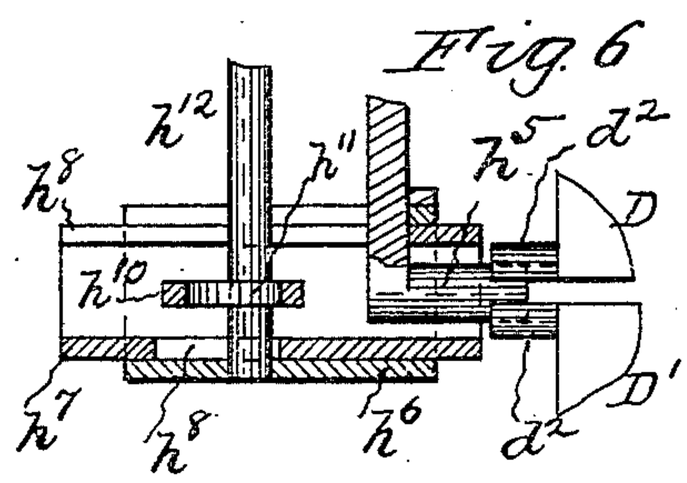

Fig. 6

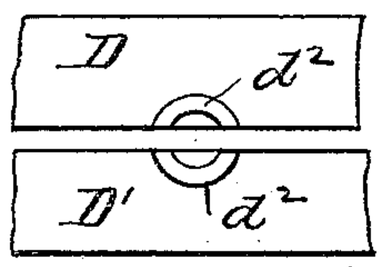

Fig. 9

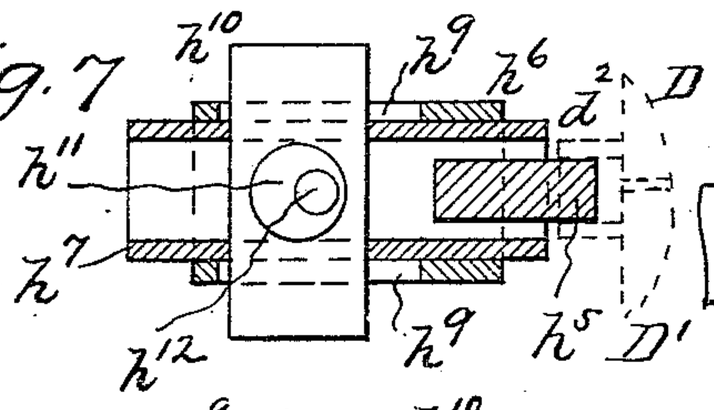

Fig. 7

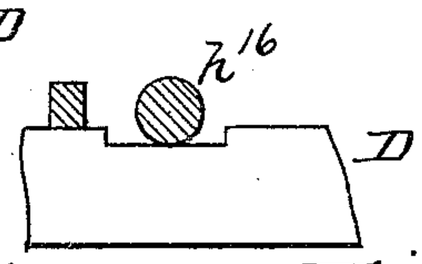

Fig. 10

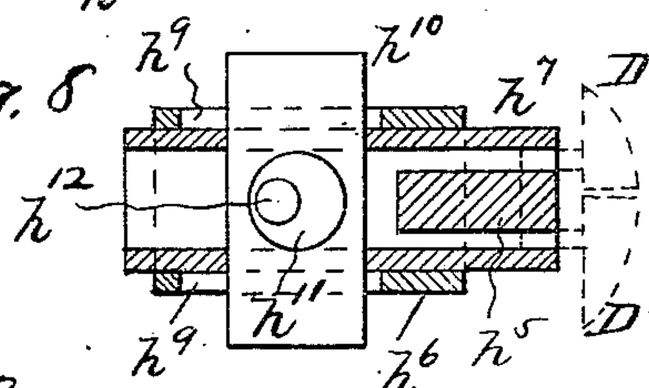

Fig. 8

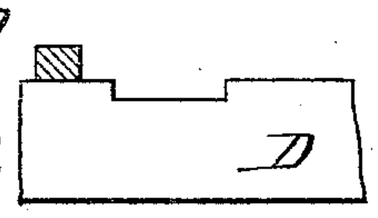

Fig. 11

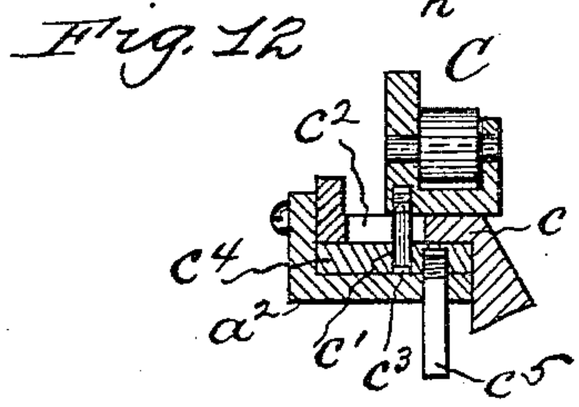

Fig. 12

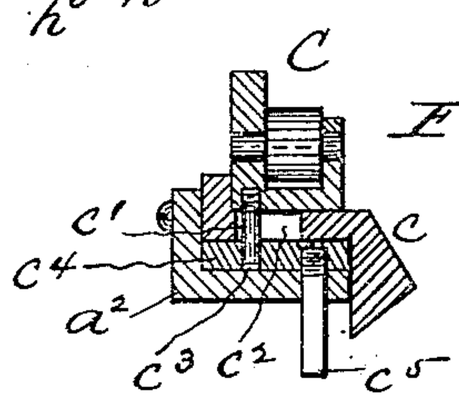

Fig. 13

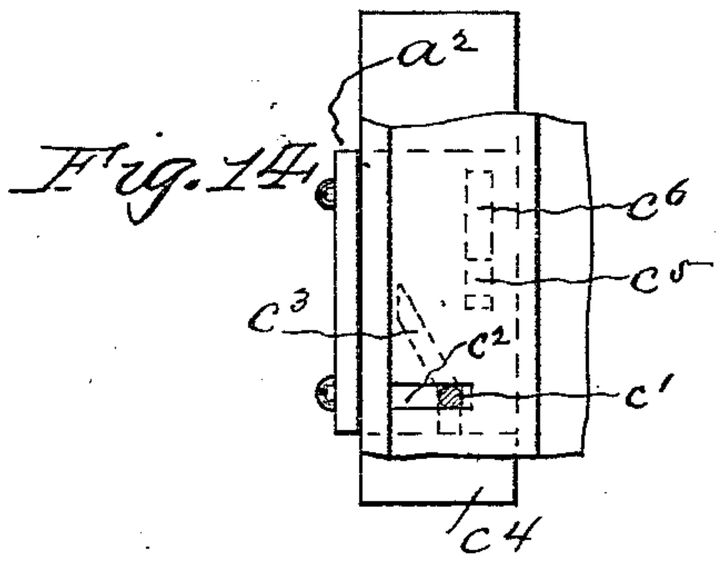

Fig. 14

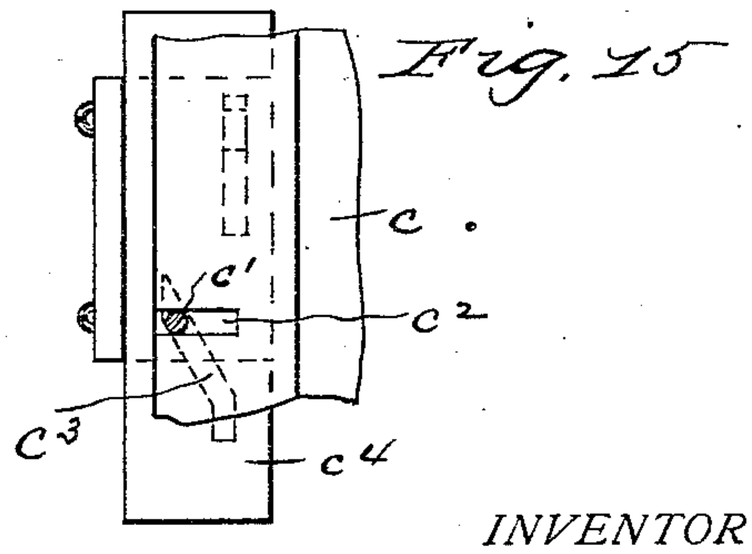

Fig. 15

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(No Model.) 6 Sheets—Sheet 6.

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APPARATUS FOR ROLLING PLATE OR SHEET GLASS.

No. 462,528. Patented Nov. 3, 1891.

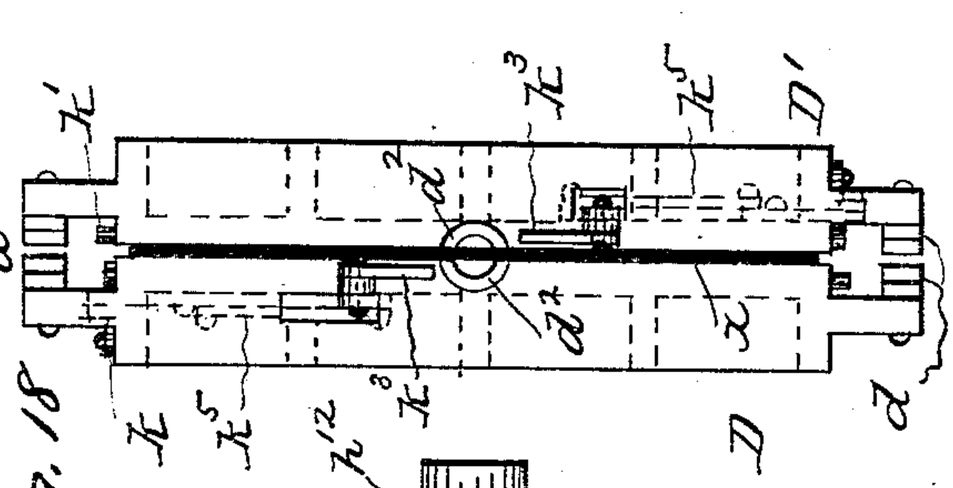

Fig. 18

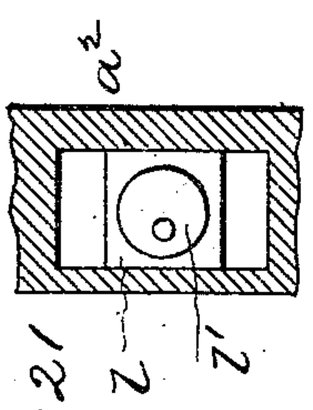

Fig. 21

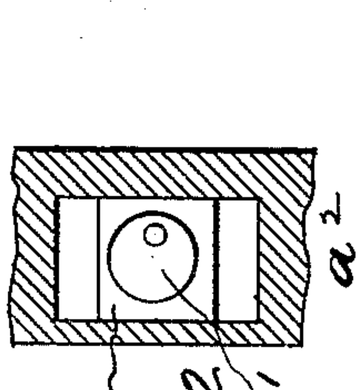

Fig. 22

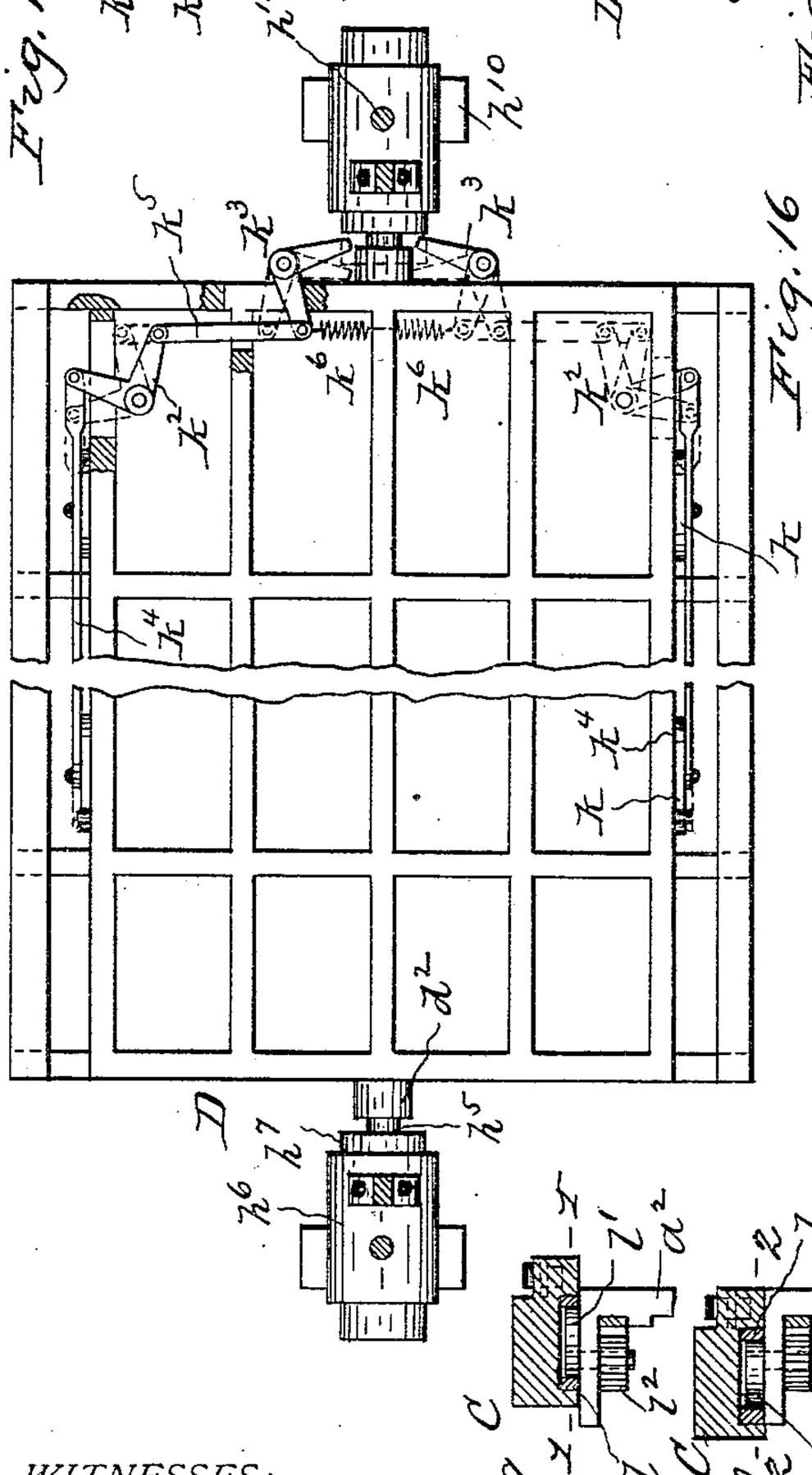

Fig. 16

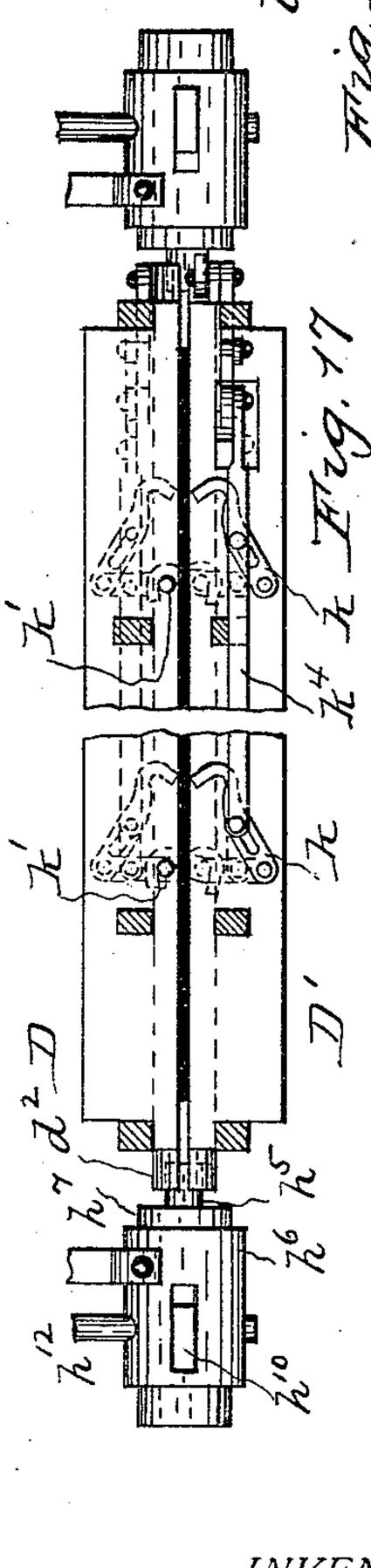

Fig. 17

Fig. 19

Fig. 20

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UNITED STATES PATENT OFFICE.

JAMES W. BONTA, OF WAYNE, PENNSYLVANIA.

APPARATUS FOR ROLLING PLATE OR SHEET GLASS.

SPECIFICATION forming part of Letters Patent No. 462,528, dated November 3, 1891.

Application filed April 7, 1891. Serial No. 388,049. (No model.)

To all whom it may concern:

Be it known that I, JAMES W. BONTA, a citizen of the United States, residing at Wayne, in the county of Delaware and State of Pennsylvania, have invented certain new and useful Improvements in Apparatus for Rolling Plate or Sheet Glass, of which the following is a specification.

My invention has relation to machines for rolling plate-glass; and it has for its object to so construct the machine that both sides of the plate can be successively rolled, and thus do away with the undue grinding necessary when the glass is rolled only on one side, the rolling of both sides of the glass removing the irregularities necessitating such grinding.

My invention accordingly consists of the combinations, constructions, and arrangements of parts, as hereinafter more particularly set forth in the specification and pointed out in the claims, reference being had to the accompanying drawings, wherein—

Figure 1 is a side elevation, partly broken away, showing a machine for rolling both sides of plate-glass in accordance with my invention. Fig. 2 is a longitudinal section, partly in elevation, of the same. Fig. 3 is an end view or elevation of the same. Fig. 4 is a like view, partly sectional, illustrating the rotation of the plate-glass and platens. Figs. 5 and 6 are respectively an end view and a side elevation of the screws or worms for lifting and lowering the platens and glass. Fig. 7 is a detail view, drawn to an enlarged scale, showing end elevation of supporting-journals and locking mechanism for the platens. Fig. 8 is a longitudinal vertical section of same with part of the platens in elevation, showing the locking or movable tubular sleeve released from the platens. Fig. 9 is a horizontal section of the same. Fig. 10 is a like view showing the locking tubular sleeve in engagement with the platens. Fig. 11 is a broken elevation of the platens. Figs. 12 and 13 are elevations broken away, the former showing stop-pin and one position of separating-strip for the platens and the latter showing said pin and another position of said strip. Fig. 14 is a cross-section of laterally-moving guide rails or supports for the platen when moving into position in the machine for rotation, said figure showing such rails or supports in their normal position. Fig. 15 is a like view showing the rails or supports moved laterally out of the way of the platens. Fig. 16 is a plan view of Fig. 14. Fig. 17 is a plan view, partly sectional, of Fig. 15. Fig. 18 is a plan view, partly sectional, showing mechanism for coupling or clamping the platens together. Fig. 19 is a side elevation, partly sectional, of the same. Fig. 20 is an end elevation of same. Figs. 21 and 22 are cross-sections showing preferable form of actuating mechanism for laterally moving the guide rail or supports for the platen, the same being shown in two different positions. Fig. 23 is a section on line 1 1, Fig. 21; and Fig. 24 is a like view on the line 2 2, Fig. 20.

A represents the housings or frame of the machine, which preferably carries an engine or motor B and has rollers or wheels a, running on guides or tracks a', so as to make it portable; but, if desired, it may be located in a fixed position.

The housings or the machine A consists of a long lower part a^2, having at its upper edges fixed guides or roller-supports a^3 and laterally-moving guides or roller-supports C, the latter being near the rear end of the machine, and are of a length approximating that of the platens D D′ used in the machine, and upon these guides or supports said platens are reciprocated to roll the plate-glass.

E E represent vertical standards secured to the housing part a^2, and have open-top bearings e, suitably formed to receive the journals f and eccentrics f' on said journals of a pressure-roller F, which is in gear with the driving-shaft b of engine B, by means of wheels f^2 and b'. The presser-roller F is provided with arms f^3 f^3, the upper end of which has a pin or other connection f^4, with slots or apertures f^5 in a curved bracket f^6 concentric with the axis of the presser-roller, said pin or connection f^4 being removable from the bracket f^6, so that by moving said arms f^5 f^3 to and fro or radially the eccentrics f' on the presser-roller journals f are moved to set the roller higher or lower to suit different thicknesses of plate-glass and also to vary the rolling pressure of the same.

The platens D D′ are provided with side racks d for engagement with the gear-wheels f^7 f^7 on the presser-roller F, and at one end said platens are provided with side recesses

d' to receive the ends g of racks g', pivoted at g^2 to racks G, which are located on the fixed guides or supports a^3 in advance of the platen.

a^4 a^4 represent vertical standards, which support a vertically-sliding frame H, of any suitable or desired construction, hung upon variable speed or other screw worms or actuating mechanism h for raising and lowering said frame, said actuating mechanism being mounted upon a shaft h', having its bearings in standards a^4, so as to be movable longitudinally by means of a shifting-lever h^2, and has a bevel or other gear wheel h^3 in engagement with like wheels b^2, b^3, and b^4 with the motor driving-shaft b. The wheel h^3 is splined to shaft h', so as to admit of the longitudinal movement of the latter when shifted and when rotating to lift or lower frame H, as hereinafter described, and said wheel is held in position to always engage the wheel b^2 by a bracket h^4 on the motor B.

In standards a^4 is journaled a shaft I, upon which at one end is splined the bevel-wheel i, having a shifting-lever i' to cause said wheel i to engage with and disengage from wheel b^3. At the other end of shaft I is a gear-wheel i^2 and a link i^3, which engages the stud-shaft i^4 of an idler-gear i^5, said stud-shaft i^4 having an end bearing in a slot i^6 in one end of the frame H, as more plainly shown in Fig. 3. The lower ends of frame H on each side thereof are provided with inside and approaching short journals or studs h^5 and with tubular boxes h^6, which inclose said journals, the forward or free ends of the latter projecting beyond said boxes. (See more plainly Figs. 7 to 10, inclusive.)

Within boxes h^6 and between them and the journals h^5 are tubular sliding sleeves h^7, having suitable slots h^8 to admit of their sliding movement. Mounted in said sleeves and working in slots h^9 of boxes h^6 are blocks h^{10}, on which are journaled eccentrics h^{11} upon vertical shafts h^{12}, mounted upon the ends of frame H. The upper ends of shafts h^{12} are provided with gear-wheels h^{13}, engaging with a sliding rack shifting or actuating bar h^{14}, so that by moving the latter in one direction the eccentrics h^{11} and blocks h^{10} are actuated to slide the sleeve h^7 in one direction, and by moving the bar h^{14} reversely said eccentrics and blocks are actuated to slide the sleeve h^7 in an opposite direction for purposes hereinafter described.

Loosely mounted upon the inner ends of boxes h^6 are gear-wheels h^{15}, which engage with the idlers i^5, and thence by wheels i^2 with shaft I. Said wheel h^{15} at suitable intervals on their inner sides are provided with stop-pins h^{16} (see more plainly Fig. 3) for a purpose hereinafter to be described.

The laterally-sliding rails or supports C (see more plainly Figs. 14 to 17) rest upon a fixed support c, secured to the housing part a^2, and have depending pins or studs c', which pass through straight lateral slots c^2 in supports c, and enter slots c^3 in sliding plates c^4 between supports c and the top edge of the housings. The slots c^3 are partly straight and partly angular, as shown more plainly in Figs. 16 and 17, so that when plates c^4 are moved in one direction the angular part of its slots c^3 actuates the studs c' therein to laterally move the roller guides or supports C in one direction, and when reversely moved said supports C are laterally moved in an opposite direction.

To actuate the plates c^4 they are provided with depending studs c^5, passing through slots c^6 in the top of the housings, and provided with a bar or link connection c^7 and a shifting or actuating lever c^8. (See Fig. 1.)

The platens D D′ are on their ends and at their middle provided with semicircular projecting journals or supports d^2 for engagement with the journals h^5 on the ends of frame H. Both platens are identical in construction, and one of them is always in position on the end of the frame H, as shown in Fig. 1, and the other upon the fixed guides a^3 in front of the presser-roller F normally to begin operations, which are substantially as follows: The presser-roller F is adjusted for the thickness of the glass and the pressure required for rolling, and after the plate-glass is laid upon the platen in front of the presser-roll, which glass is indicated at X, the pivoted racks g' are engaged with the recesses d' in the platen, the movement of the presser-roller engages the racks d of the platen to move it in the direction of arrow 1, and as it is so moved the glass is rolled on one side. The platen so moves until it comes under the platen D′, supported upon the frame H, the racks g' and G being provided and keeping in engagement with the presser-roller gears f^7 to admit of the full length of such movement. As soon as the platen D arrives at such described position the pivoted racks g' are raised out of engagement with the platen by means of a lever g^3, (see more plainly Fig. 2,) meanwhile the rotation of the presser-roller having been stopped or its actuating mechanism being thrown out of gear. The shaft h' is then shifted to lower the frame H and platen D′ until the latter rests upon the platen D, with the journals h^5 of the frame H between the semicircular boxes or bearings d^2 of the platens. (See Fig. 2.) The shifter-bar h^{14} is then actuated to project or slide the tubular sleeves h^7 into engagement with the platen boxes or bearings d^2 to lock the same together. The shaft h' is then actuated to raise both platens, and during such movement the guides or supports C are moved outwardly or apart from one another by actuating-lever c^8, so that said platens can be rotated without raising them to an undue height. When sufficiently raised, the movement of shaft h' is stopped and the shaft I is put into operation to rotate wheels h^{15}, the stops or studs h^{16} of which being in engagement with the platens, as shown in Fig. 4, the latter are rotated to bring the platen D on top, reversing the position of the platens and

bringing the unrolled side of the glass uppermost. The shaft h' is then actuated to lower the platens, the lever c^8 being meanwhile shifted to return the supports C to their normal position to receive the platens. Bar h^{14} is shifted to unlock the sleeves h^7 from the platen boxes or bearings d^2, and the shaft h' is then actuated to raise the upper platen D from the lower one D′, the glass remaining upon the latter. The pivoted rack g' is then moved into engagement with the recesses in platen D′, and the presser-roller F is then started, but in a reverse direction to cause platen D′ to move in a direction the opposite of that indicated by arrow 1, Fig. 1, to roll the other side of the glass.

If desired, the platens may be furnished with pivoted clamps k and k', the former being on one and the latter on the other platen, (see Figs. 18 to 20,) for clamping the platens at their sides when rotated. These clamps k may be connected to suitably-arranged angle-levers k^2 k^3 by links k^4 k^5, having reacting springs k^6, the free ends of the levers k^3 being in line with the inner end of the clamping tubular sleeves h^7, so that when the latter are moved to clamp the studs or journals d^2 of the platens said sleeves will also actuate the levers k^3 to automatically cause the clamps k to engage with the studs k', and when said sleeves are released the reacting springs k^6 will act to cause the levers k^2 k^3 to move to unlock the clamps k from the studs k'.

Instead of using the actuating mechanism for the movable guides C, as above described, and shown in Figs. 14 to 17, a block l with eccentric l', having a gear connection l^2 with a shifting rack-bar, may be substituted, as shown in Figs. 21 to 24. It will be noted, therefore, that the details of construction of the machine may be greatly varied without departing from the spirit of the invention; and I do not therefore limit myself to the construction and arrangement of parts as shown and described, as the essence of the invention is the provision of mechanism for rolling both sides of plate-glass successively.

In another pending application of even date herewith I have claimed the method herein described for rolling glass plates, said application having Serial No. 388,050; and hence I do not herein claim such method. If desired, suitably-located heating-pipes m m' may be provided for the platens to prevent chilling of the glass.

What I claim is—

1. In a plate-glass-rolling machine, the combination of a presser-roller, a movable platen passing the glass under said roller, a vertically-sliding frame having journals carrying a second platen, devices for bringing both of said platens together and locking their journals, means for raising and lowering said locked platens, devices for rotating the platens and for releasing the same with the unrolled side of the glass uppermost, and means for moving the platen containing the glass through or past the presser-roller, substantially as set forth.

2. The combination of a presser-roll, a power mechanism, a movable platen, a normally-stationary platen, and devices for locking the platens together, raising and lowering them, and rotating them to reverse the sides of the plate-glass relatively to the presser-roll, substantially as set forth.

3. The combination of an adjustable presser-roller for rolling plate-glass, a movable platen passing in one direction under said roll, a normally-stationary platen in line with said movable platen when it completes its movement for rolling the glass on one side thereof, devices for locking said platens together and for rotating them to bring said last-named platen to position for passing the plate through or under the presser-roll to roll the opposite side of the glass, substantially as set forth.

4. In a plate-glass-rolling machine, a presser-roll, two separate platens, locking devices for supporting said platens with the plate-glass between them, and devices for rotating the platens, substantially as set forth.

5. The combination of a vertically-moving frame, journals on said frame for supporting a platen, actuating devices for raising and lowering said platen and a second platen when brought into alignment therewith, and locking devices for securing said platens together and for rotating them, substantially as set forth.

6. The combination of a vertically-moving frame, journals secured thereto, tubular sleeves surrounding said journals, means for sliding said sleeves, and devices for raising and lowering said frame, substantially as set forth.

7. The combination, with platens D D′, means for raising and lowering and for rotating them, of the laterally-moving guides or supports C, substantially as set forth.

8. In a plate-glass machine, a platen supported on end journals, a sliding platen adapted to register with said journaled platen, and devices for bringing said platens together, locking them, and rotating the same, substantially as set forth.

9. In a plate-glass-rolling machine, a presser-roller, a reciprocating platen, a second platen supported upon a vertically-sliding frame carrying gear-wheels in engagement with said platen, means for locking said platens together, and actuating mechanism, substantially as set forth.

In testimony whereof I affix my signature in presence of two witnesses.

JAMES W. BONTA.

Witnesses:

S. J. VAN STAVOREN,

CHAS. F. VAN HORN.