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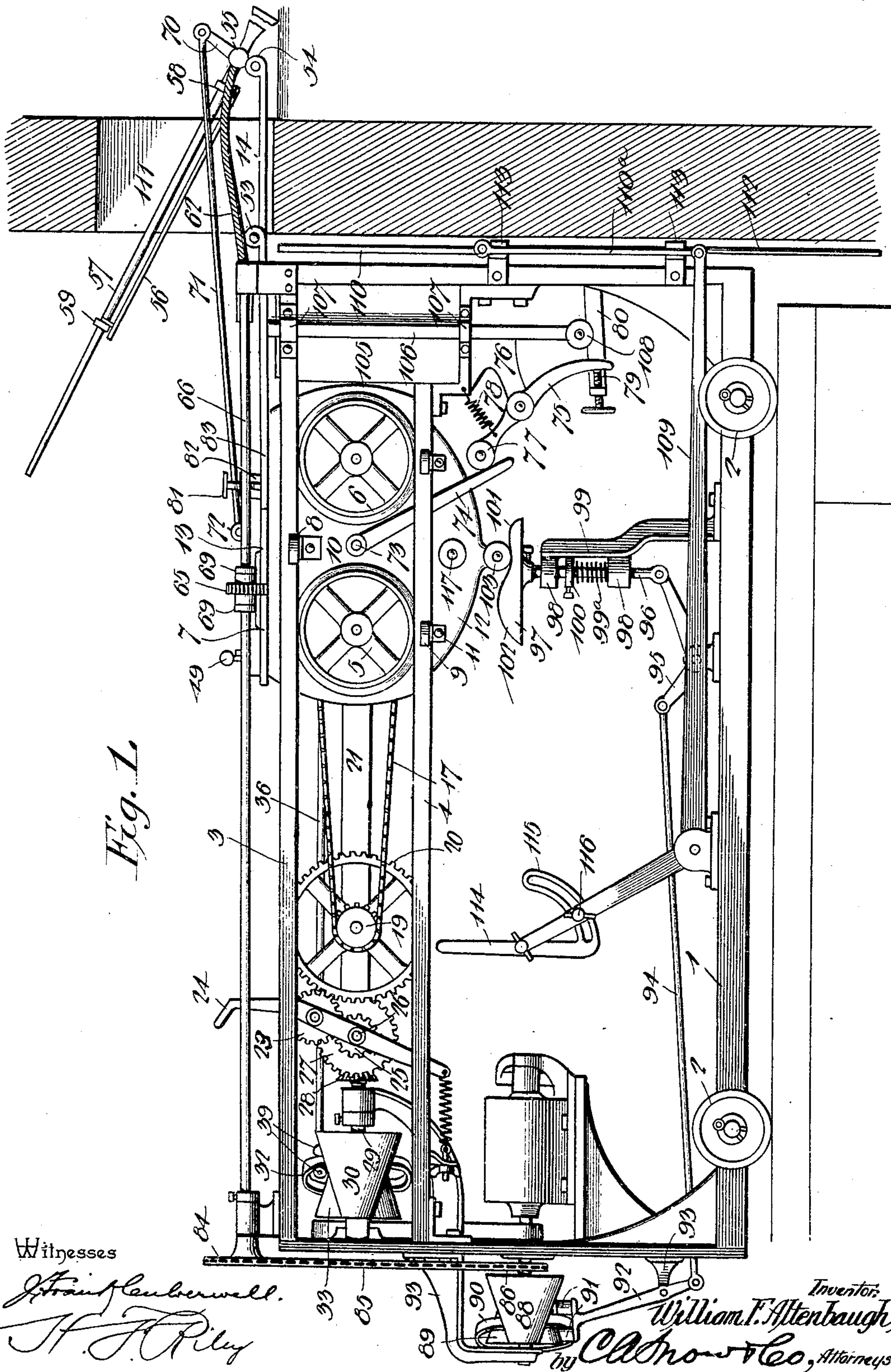
PATENTED AUG. 30, 1904.

W. F. ALTENBAUGH.
GLASS GATHERING MACHINE.

APPLICATION FILED APR. 25, 1901.

NO MODEL.

4 SHEETS—SHEET 1.



Witnesses

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4 SHEETS—SHEET 2.

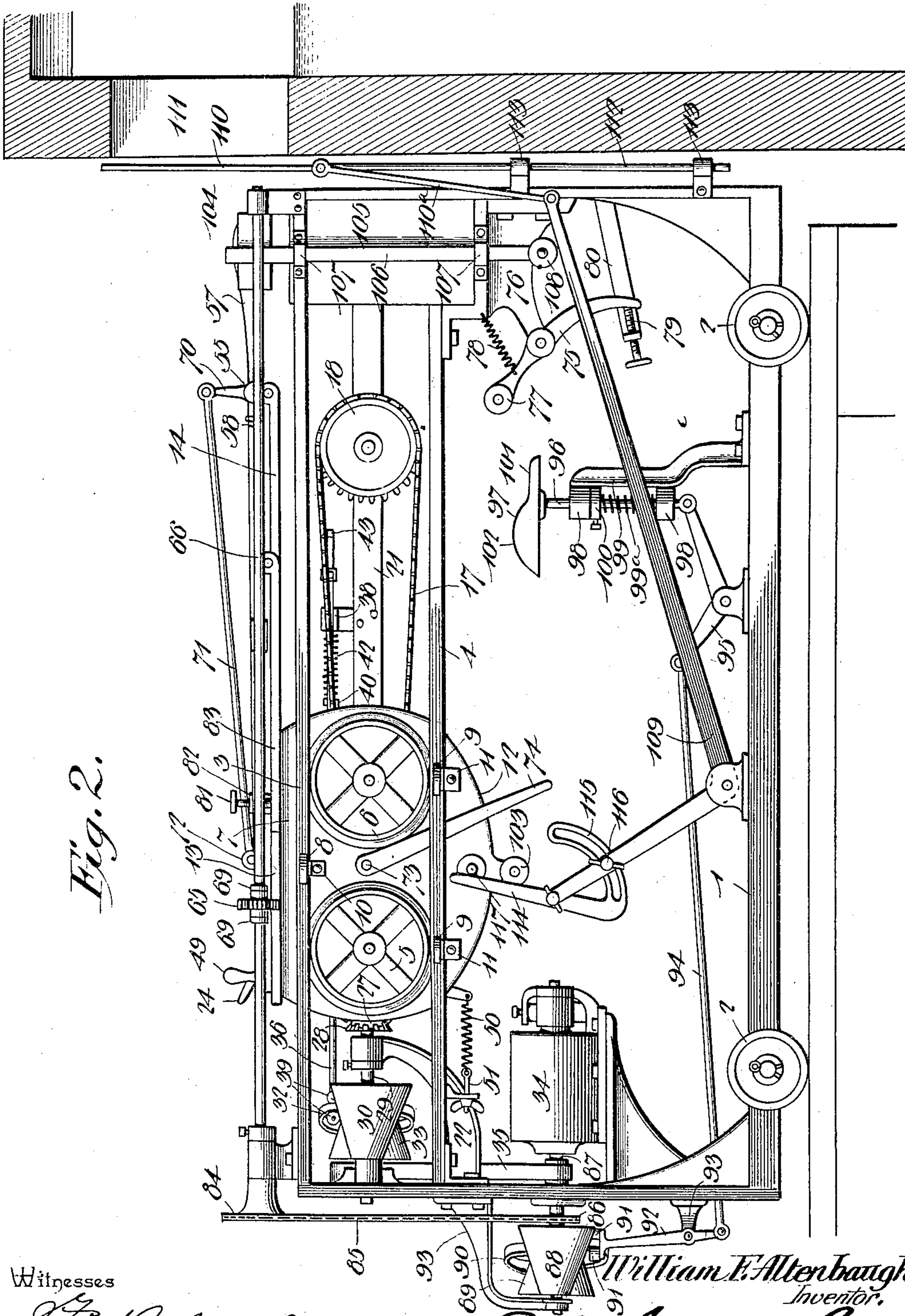


Fig. 2.

Witnesses

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4 SHEETS—SHEET 3.

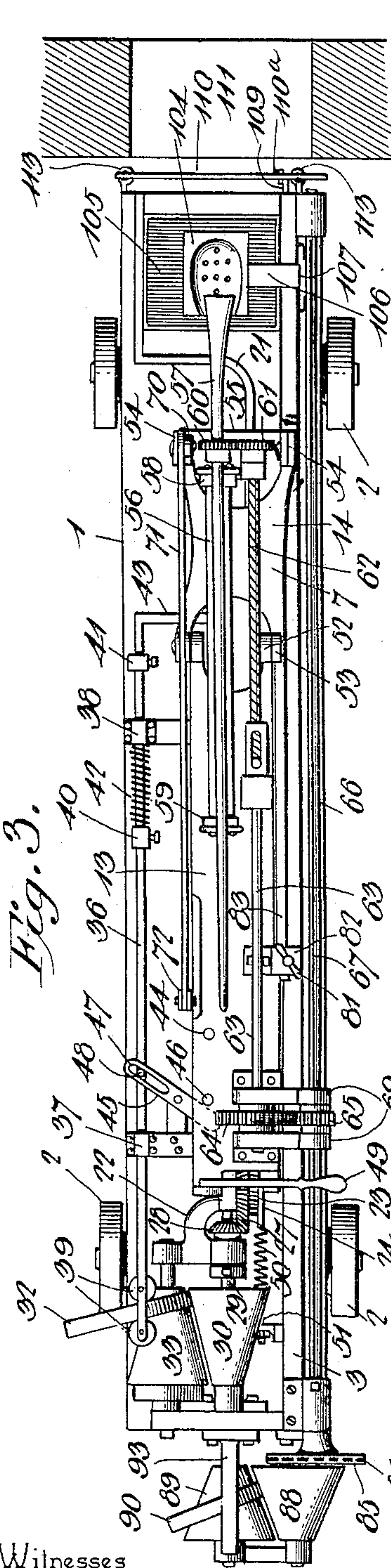


Fig. 3.

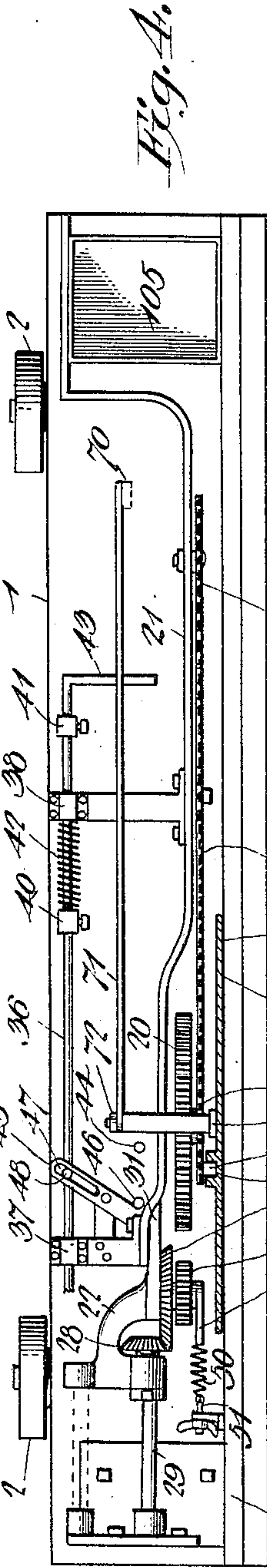


Fig. 4.

Fig. 5.

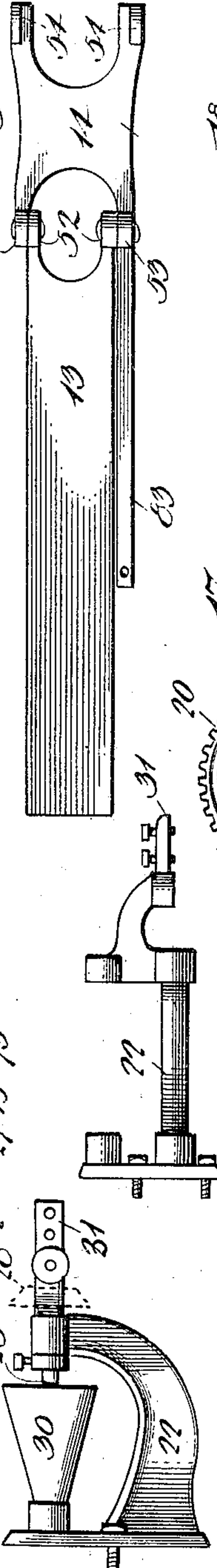


Fig. 6.

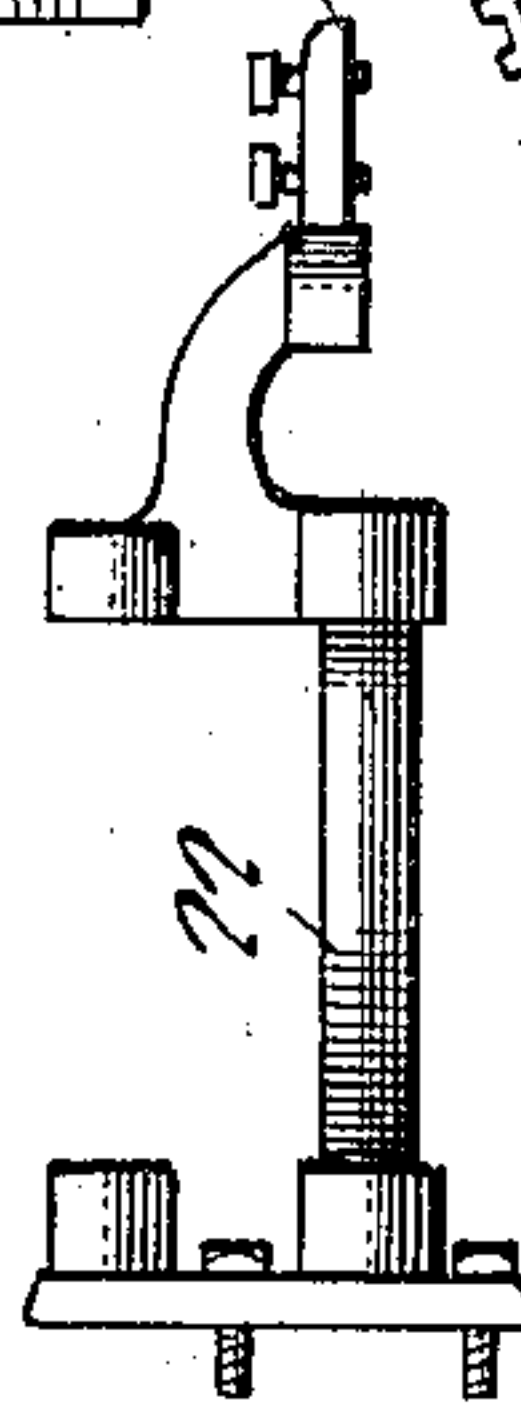


Fig. 7.

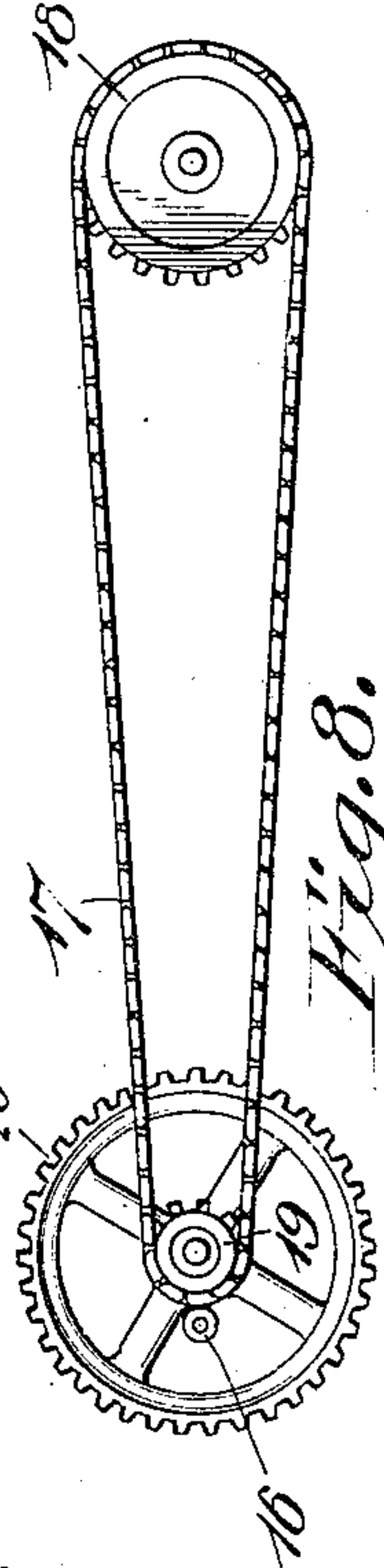


Fig. 8.

Witnesses

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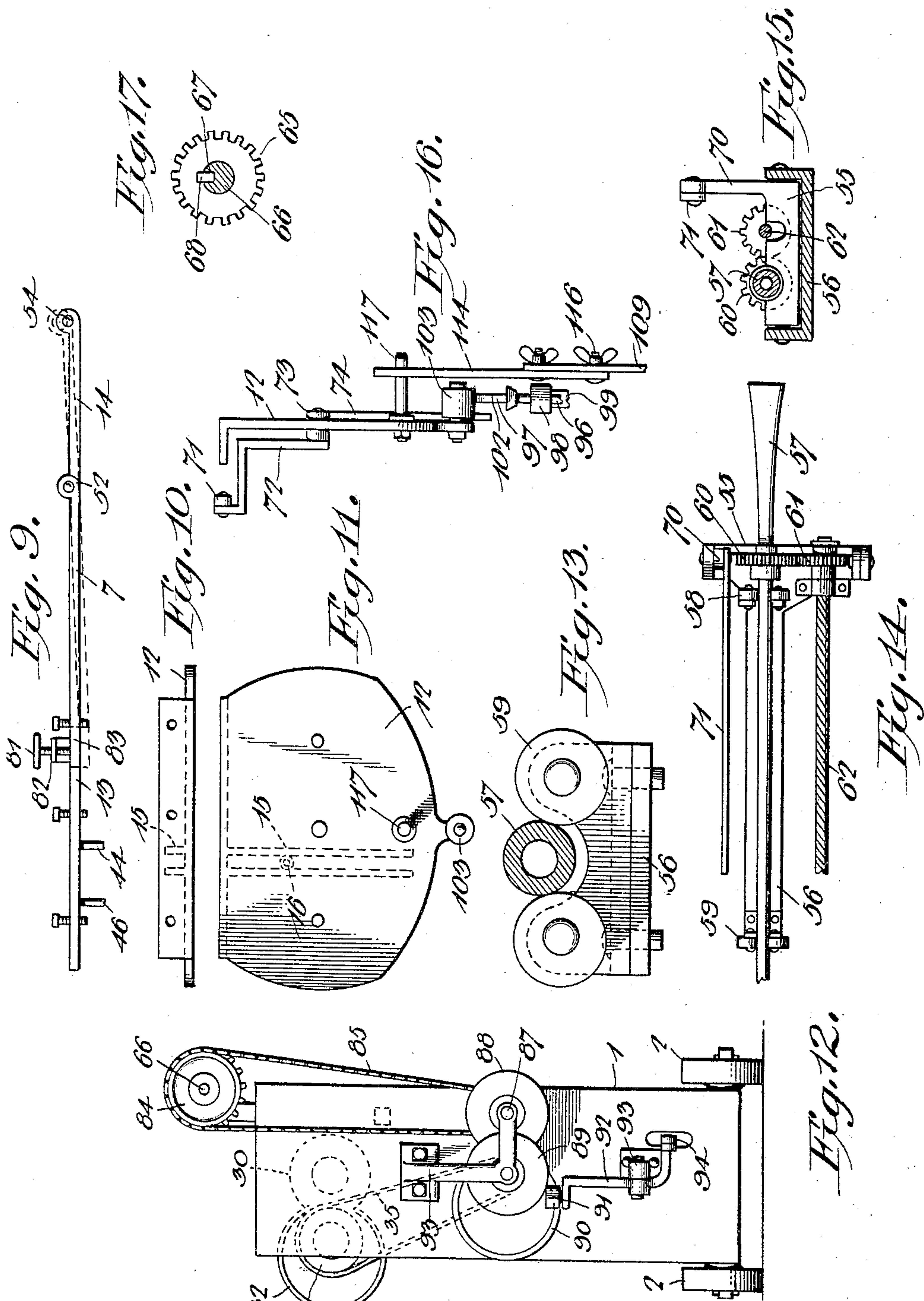
PATENTED AUG. 30, 1904.

W. F. ALTENBAUGH.
GLASS GATHERING MACHINE.

APPLICATION FILED APR. 26, 1901.

NO MODEL.

4 SHEETS—SHEET 4.



Witnesses

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UNITED STATES PATENT OFFICE.

WILLIAM FRANCIS ALTENBAUGH, OF TIFFIN, OHIO, ASSIGNOR TO ROBERT J. BEATTY, OF WASHINGTON, PENNSYLVANIA.

GLASS-GATHERING MACHINE.

SPECIFICATION forming part of Letters Patent No. 768,970, dated August 30, 1904.

Application filed April 25, 1901. Serial No. 57,428. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM FRANCIS ALTENBAUGH, a citizen of the United States, residing at Tiffin, in the county of Seneca and State of Ohio, have invented a new and useful Glass-Gathering Machine, of which the following is a specification.

The invention relates to improvements in glass-gathering machines.

The object of the present invention is to improve the construction of glass-gathering machines and to provide a simple and comparatively inexpensive one adapted to automatically advance a pivotally-mounted rotating gathering instrument into the working chamber and dip the same while in the chamber to gather a quantity of glass and to return the gathering instrument, and capable of enabling the inclination or pitch of the gathering instrument to be quickly changed, and also of enabling a maximum amount of glass to be gathered on an instrument having a minimum-sized head and at the extreme outer end of the same.

A further object of the invention is to enable the carriage and the gathering instrument to be driven at a variable speed to cause the carriage to be rapidly moved to and from the working chamber and slowly moved during the dipping action of the gathering instrument and to enable the gathering instrument to be rapidly rotated while it is gathering the glass and to be slowly rotated after such operation to prevent the glass from being thrown off it by centrifugal force.

Another object of the invention is to enable this change of speed to be gradually effected to avoid jarring or jerking either the carriage or the gathering instrument.

The invention also has for its object to provide means for automatically raising and lowering a forming-block from a water tank or receptacle to maintain the forming-block at a comparatively low temperature, and, furthermore, it is the object of the invention to provide a door or shield for automatically closing or covering the entrance to the working chamber to protect the operator from the heat, and

also to effect a saving in the gas for heating the working chamber.

The invention consists in the construction and novel combination and arrangement of parts, hereinafter fully described, illustrated in the accompanying drawings, and pointed out in the claims hereto appended.

In the drawings, Figure 1 is a side elevation of a glass-gathering machine constructed in accordance with this invention, the gathering instrument being extended into the working chamber. Fig. 2 is a similar view, the carriage being run back and the mouth or entrance to the working chamber being closed or covered by the door or shield. Fig. 3 is a plan view, the parts being arranged as illustrated in Fig. 2. Fig. 4 is a similar view, partly in section, the top of the carriage being removed. Fig. 5 is a plan view of the carriage. Figs. 6 and 7 are detail views illustrating the construction of the bracket for supporting the cones for operating the carriage. Fig. 8 is a detail view of the sprocket-gearing for reciprocating the carriage. Fig. 9 is a detail view of the top of the carriage. Figs. 10 and 11 are similar views of the body portion of the carriage. Fig. 12 is an end elevation of the machine. Figs. 13, 14, and 15 are detail views illustrating the manner of mounting the gathering instrument. Fig. 16 is a detail view of the carriage and a portion of the depressible shoe and the lever for operating the door or shield. Fig. 17 is a detail sectional view illustrating the construction of the grooved shaft.

Like numerals of reference designate corresponding parts in all the figures of the drawings.

1 designates a supporting-frame approximately rectangular in side elevation and provided at its bottom with suitable wheels 2 for enabling the machine to be moved bodily from one glass-tank to another when desired. The frame is provided at its top with upper and lower parallel horizontal rails 3 and 4, receiving flanged wheels 5 and 6 of a carriage 7, which is adapted to be reciprocated by the means hereinafter described to carry it to and

from the mouth or entrance of the glass-tank. The flanges of the wheels 5 and 6 are arranged at the inner side faces of the upper and lower rails 3 and 4, and the outer side faces of the rails 3 and 4 are engaged by upper and lower horizontally-disposed antifric-
 5 tion-wheels 8 and 9, mounted on suitable brackets or supports 10 and 11 and arranged as clearly illustrated in Figs. 1 and 2 of the
 10 drawings. The brackets or supports 9 and 10, which are mounted on the carriage at points below the rails, extend outward beyond the latter and receive the antifric-tion-wheels on their extended outer portions.

15 The reciprocating carriage is composed of a thin vertical body portion 12, a fixed horizontal top portion 13, and an adjustable extension or section 14, hinged at its inner end to the adjacent end of the top portion or plate
 20 13 and adapted to be swung upward and downward for a purpose hereinafter explained. The thin vertical body portion of the carriage is provided with a vertical groove or way preferably formed by vertical ribs
 25 15, and receiving a projecting antifric-tion-roller 16, extending laterally from a sprocket-chain 17, disposed longitudinally of the machine and adapted to carry the carriage back-
 30 ward and forward. The sprocket-chain 17 is arranged on a sprocket-wheel 18 and on a sprocket-pinion 19, the sprocket-wheel being mounted on a longitudinal supporting-bar 21
 35 and being located adjacent to the front of the machine or the end adjacent to the glass-tank, and the said sprocket 18 is of sufficient diameter to cause the carriage to remain at the front of the machine during the glass-
 40 gathering operation a sufficient length of time to afford ample opportunity for such operation. The pinion 19 is rigid with and carried by a gear-wheel 20, suitably mounted on the supporting-bar 21, which is secured at its
 45 rear end to a bracket 22. The carriage is automatically stopped at the rearward limit of its movement, and when so stopped by the means hereinafter described the laterally-pro-
 50 jecting antifric-tion-wheel is left on the dead-center or in alinement with the centers of the sprocket-wheel 18 and the sprocket-pinion 19, as clearly illustrated in Fig. 8 of the accom-
 55 panying drawings.

The gear-wheel 20 receives its motion from a shiftable pinion 23, mounted on a shifting lever 24 and meshing with a pinion 25, which
 55 is mounted on the shaft 26, which forms a fulcrum for the shifting lever. The shaft 26, which is a short or stub shaft, projects from the bracket 22, and the pinion 23 is adapted to be swung into and out of mesh with the
 60 gear-wheel 20 without disengaging it from the central pinion 25. This central pinion 25 is suitably fixed to or connected with a bevel gear-wheel 27, arranged vertically and meshing with a transversely-disposed bevel-pinion
 65 28, which is connected with a longitudinal

shaft 29, upon which a cone 30 is mounted. The bracket 22, which is secured to the rear end of the frame of the machine, is provided with an arm 31, which is bolted or otherwise
 70 secured to the rear end of the longitudinal supporting-bar 21, as clearly illustrated in Fig. 4 of the accompanying drawings. The bevel-pinion 28 may be provided with a hub or extension arranged in a suitable bearing of the bracket 22, as illustrated in Fig. 4, and the
 75 hub or extension of the pinion 28 may be secured to the cone-shaft 29 in any suitable manner.

The cone 30 is rotated by means of a flexible elastic ring 32, interposed between the cone
 80 30 and a reversely-arranged cone 33, which receives its motion for a suitable motor 34. The motor 34, which is preferably operated by electricity, is connected by a belt 35 and suitable pulleys with the driving-cone 33,
 85 and the elastic ring 32, which insures a rotation of the cone 30, encircles the driving-cone 33 and is adapted to be shifted longitudinally of the cones by the means hereinafter de-
 90 scribed, to vary the speed of the carriage, to cause the same to travel rapidly to and from the glass-tank, and to produce a slow move-
 95 ment of the sprocket-gearing while the carriage is adjacent to the tank and while the operation of gathering a quantity of glass is being effected. By moving or shifting the ring
 32 outward or rearward it is carried to the larger portion of the driving-cone and to the smaller portion of the cone 30, and the rela-
 100 tive diameters of the active portions of the cones are thereby varied, and the speed will be gradually increased as the ring is carried outward, and by moving the ring inward it is
 105 carried toward the smallest portion of the driving-cone and the largest portion of the cone 30, and the speed of the carriage is consequently greatly reduced. The cones may be made of any desired size to secure the nec-
 110 essary variable speed to adapt the machine for the class of work for which it is designed to be employed, and the change of speed is effected without jarring or jerking the car-
 115 riage or the gathering instrument, hereinafter described.

The ring 32, which is interposed between
 115 the reversely-arranged cones, is shifted to provide a slow movement of the carriage at the ends of its reciprocation and a rapid move-
 120 ment between the same, by means of a longitudinal rod 36, mounted in suitable guides 37 and 38 and provided at its rear end with a pair of antifric-tion-wheels 39, located at op-
 125 posite sides of the ring and adapted to move the same backward and forward as the rod 36 is reciprocated. The guides 37 and 38 consist of brackets or arms secured to and ex-
 130 tending approximately horizontally from the longitudinal supporting-bar 21. The movement of the rod is limited by means of ad-
 135 justable collars 40 and 41, located at opposite

sides of the arm or bracket 38, as clearly shown in Figs. 3 and 4. The spring is disposed on the rod 36 and is interposed between the arm or bracket 38 and the adjustable collar 40, which is located in rear of the said bracket or arm 38. The other collar 41 is located in advance of the bracket or arm 38, and it limits the rearward movement of the rod 36 by the spring 42, which is adapted to automatically carry the ring 32 backward to cause a rapid operation of the carriage. The adjustable collars are preferably provided with set-screws, and by adjusting the collar 41 the speed of the carriage when it is moving most rapidly may be regulated, and any desired speed may be obtained to adapt the machine to the character of the work for which it is employed.

The front end of the rod 36 is bent at right angles to provide an inwardly-extending transversely-disposed arm 43, which is arranged in the path of a depending projection or pin 44, and which is adapted to be engaged by the same when the carriage nears the limit of its forward movement, whereby the speed will be reduced at that point. The carriage carries the rod 36 forwardly and compresses the coiled spring 42, and after the glass-gathering operation has been completed and the carriage again moves rearward the coiled spring will advance and shift the ring 32 to the back of the driving-cone, and thereby increase the speed of the carriage to cause the same to move backward rapidly. As the carriage nears the back of the machine the rod 36 is again shifted to reduce the speed by means of a transverse lever 45, fulcrumed between its ends on an extension of the arm or bracket 37 and having its inner arm arranged in the path of a depending projection or pin 46, located adjacent to the said pin 44. The outer arm of the transverse lever is provided with a slot 47 for the reception of a pin or projection 48 of the rod 36, and when the inner arm of the lever 45 is moved rearward by the carriage the rod 36 will be thrown forward and the speed of the carriage will be again reduced. As soon as the coiled spring 42 is free to act it will again carry the rod 36 rearward and increase the speed of the carriage.

The carriage is stopped at the end of its rearward movement by means of a pivoted bar or lever 49, mounted on and extending transversely of the back of the carriage and arranged to engage the upper portion of the shifting lever 24, whereby the pinion 23 is swung out of engagement with the gear-wheel 20, as before explained. This operation is completely effected when the laterally-projecting antifriction-roller of the endless sprocket-chain is at the dead-center before explained. The shifting lever 24 is arranged in an upright position and the oscillatory shiftable gear 23 is located above the fulcrum of the lever. The lower end of the shifting

lever 24 is connected with a coiled spring 50, and its upper end is provided with an inclined arm or portion, as clearly shown in Fig. 1. The spring 50, which is located at a point beneath the lower rail 4, is connected at its outer end with a screw 51, having an adjusting-nut which is adapted to vary the tension of the spring. The screw passes through an opening of an arm which depends from the lower rail, and the nut engages the rear face of the arm, as clearly shown in Fig. 1. The motor is mounted on a suitable bracket, and it is located at the back of the machine at a point below the cone 30. The pivoted bar or lever 49, which is provided at its outer end with a suitable grip or handle, is adapted to be swung upward out of engagement with the shifting lever when it is desired to start the carriage, and the spring 50 will then swing the gear 23 into mesh with the gear-wheel 20, and the carriage will be again moved forward. As soon as the carriage is started it will continue its operation, and the pivoted bar or lever may be dropped upon the inclined upper arm or portion of the shifting lever, as it will not be necessary to hold the same in an elevated position until it is carried beyond the shifting lever by the forward movement of the carriage.

The top of the carriage may be secured to the vertically-disposed body portion in any suitable manner, and it is provided at its front end with eyes 52, which are hinged to corresponding eyes 53 of the hinged section 14 by means of suitable pintles. The hinged section or member 14, which is advanced into the glass-tank, as illustrated in Fig. 1 of the accompanying drawings, is provided at its front end with suitable upwardly-extending bearings 54, between which is pivoted a bearing-bracket 55. The bearing-bracket, which forms the front portion of a pivotally-mounted holder, is secured to a plate 56, which forms the body portion of the holder, and this holder is adapted to receive a gathering-tool 57. The gathering-tool 57 is supported by antifriction rollers or wheels 58 and 59, arranged in pairs and located at the front and back of the pivoted holder, as clearly illustrated in Fig. 14 of the accompanying drawings. These antifriction-rollers, which permit a practically frictionless rotation of the glass-gathering instrument, may be mounted in any suitable manner, preferably by means of brackets secured to or forming a portion of the holder. The gathering instrument, which consists of a blow pipe or tube, is provided at a point intermediate of its ends with a gear-wheel 60, having a hub or central portion which is designed to be brazed or otherwise secured to the gathering instrument. This gear-wheel, which is located at the front of the holder, meshes with a corresponding gear-wheel 61, mounted on the front of the holder at one side of the gathering instrument and

connected by a flexible shaft 62 with a shaft 63, extending longitudinally of the carriage and journaled in suitable bearings of the same. The flexible shaft, which permits the holder to be arranged at any angle, is suitably coupled to the front end of the longitudinal shaft 63. The longitudinal shaft 63 has keyed or otherwise secured to it a transverse gear-wheel 64, which meshes with a pinion 65, which is slidingly mounted on a longitudinal shaft 66. The longitudinal shaft 66, which is arranged at one side of the main frame of the machine, is journaled at its ends in suitable bearings, and it is provided with a longitudinal groove 67, receiving a key 68 of the pinion 65, whereby the latter is slidingly connected with the longitudinal shaft. The pinion 65 is located between a pair of arms 69 of the carriage, and as the latter moves backward and forward it carries the said pinion 65 with it, whereby motion is communicated from the said shaft 66 to the gathering instrument in whatever position the carriage may occupy. The front end of the pivoted holder is provided with an upwardly-extending arm 70, which is connected by a longitudinal rod 71 with an arm 72 of a short shaft 73, which extends through the central portion of the body of the carriage and which is provided at the opposite side of the same with an arm 74. The arm 74 depends from the shaft at one side of the body portion of the carriage, and the arm 72 extends upward at the opposite side of the carriage, the two arms and the transverse shaft constituting a lever which is fulcrumed on the carriage and which is adapted to be automatically operated at the end of the forward movement of the carriage to swing the arm 70 forward and tilt the holder, whereby the gathering instrument is dipped into molten glass within the working chamber of the glass-tank.

The depending arm 74 is arranged to engage an adjustable device located in the path of the said arm 74 and consisting of a lever 75, fulcrumed between its ends on an arm of a bracket 76, and provided at its upper end with an antifriction-roller 77, arranged to ride on the arm 74 when the carriage nears the limit of its forward movement. The adjusting device forms a stop for the depending arm 74, and the continued forward movement of the carriage causes an oscillation of the lower arm 74 and the upper arm 73, which depresses the front end or head of the gathering instrument. The upper arm of the lever 75 is connected with a spring 78, which holds the lower arm of the lever 75 against an adjusting-screw 79, mounted in a threaded opening of a suitable support 80 and capable of adjusting the lever to vary the dip or pitch of the gathering instrument. By throwing the upper end of the lever 75 forward the oscillation of the arm 74 will be increased, and the movement of the gathering instrument

will be correspondingly affected. The spring 78 is secured to the upper arm of the lever 75 and to the bracket 76, and it holds the lower end of the said lever 75 firmly against the adjusting-screw 79. The pitch of the gathering instrument may also be changed by means of an adjusting-screw 81, mounted in a threaded opening of a bracket 82 of the carriage and arranged over a longitudinal arm 83, extending rearward from the hinged section or member 14 and located at one side of the top of the carriage, as clearly illustrated in Fig. 5 of the accompanying drawings. By depressing the arm 83 the hinged section or member 14 may be elevated, and by raising the arm 83 the section or member 14 will be depressed. By varying the pitch of the gathering instrument the latter may be caused to dip to a greater or less extent into the molten glass, and it may be arranged to gather a maximum amount of glass on a minimum-sized gathering-head. Also it may be arranged to gather the glass on the extreme outer edge of the head.

The gear-wheel 61 is permanently mounted in suitable bearings of the pivoted holder, and the said antifriction-wheels 58 and 59 form open bearings for the gathering instrument, which may be readily lifted from the holder and replaced therein. The rear end of the grooved longitudinal shaft carries a sprocket-wheel 84, which meshes with a sprocket-chain 85, that extends downward to a sprocket-pinion 86 of a cone-shaft 87. The cone-shaft 87 carries a cone 88, arranged similar to the cone 30, heretofore described, and cooperating with a reversely-arranged cone 89, mounted on the collar-shaft of the motor 34, as clearly illustrated in Figs. 2 and 12 of the accompanying drawings. An elastic ring 90 is interposed between the reversely-disposed cones 88 and 89 and is adapted to be shifted backward and forward in the same manner as the ring 32, heretofore described, to vary the speed of the gearing for rotating the gathering-tool to cause the same to rotate rapidly while gathering the glass and to rotate at a less rate of speed while the carriage is moving backward to prevent the glass from being thrown off the instrument by centrifugal force. This change of speed is effected without jarring or jerking the gathering instrument, and the lower portion of the elastic ring 90 is arranged between a pair of antifriction-wheels 91, located at the upper end of a shifting lever 92, arranged below the cones 88 and 89, which are supported by an exterior bracket 93. The shifting lever 92, which is arranged in an upright position, is fulcrumed between its ends on a suitable support, and its lower end is connected by a longitudinal rod 94 with one arm of a bell-crank lever 95, which is fulcrumed at its angle and which has its other arm connected with a stem 96 of a depressible shoe 97. The stem 96, which

is vertically movable in suitable guides 98 of a bracket 99, is located beneath the rails 3 and 4 and has a coiled spring 99^a disposed on it and interposed between the lower guide of the bracket and an adjustable collar 100, whereby the coiled spring is adapted to support the depressible shoe in an elevated position, as clearly illustrated in Fig. 2 of the accompanying drawings. When the shoe is depressed, the shifting lever is oscillated and its upper portion is swung outward to carry the ring 90 to the rear ends of the cones to reduce the speed of the gearing for rotating the gathering instrument. The front portion 101 of the shoe is depressed and is arranged at a point below the rear portion 102, which is extended above the front portion of the shoe. The upwardly-projecting rear portion 102, which presents a convex face, is arranged in the path of a laterally-projecting antifriction roller or wheel 103, mounted on a depending extension of the carriage, as clearly shown in Fig. 16. When the carriage nears the front of the machine, it depresses the shoe, and the gathering instrument is rapidly rotated while it is being dipped into the molten glass, and this rapid rotation continues during the first portion of the backward movement of the carriage while the head of the gathering instrument is depressed and while it is gathering a supply of the molten glass. The glass is gathered on the backward movement of the gathering instrument to avoid plugging the opening or bore of the latter, and as the gathering instrument is raised from the glass of the working chamber the speed of the gearing for rotating it is reduced, and the said gathering instrument is slowly rotated to prevent any of the glass from being thrown off by centrifugal force. This reduction in the speed of the gearing for rotating the gathering instrument is effected by the sloping or inclined rear portion of the shoe engaging the laterally-projecting roller or wheel 103 of the carriage and permitting the shoe to partially rise, and as soon as the carriage moves beyond the shoe the coiled spring 99 will automatically lift the latter and shift the ring 90 to the inner or front ends of the cones to effect a slow rotation of the gathering instrument. As the carriage nears the limit of its rearward movement a vertically-movable forming-block 104 is lifted from a water tank or receptacle 105, located at the front of the frame of the machine and mounted on the bracket 76, as clearly shown in Figs. 1 and 2. The forming-block, which is of the ordinary configuration, and which is provided with perforations for the passage of water, is dipped into the latter to prevent it from becoming too hot, and it is connected at one side with a horizontal arm of a vertically-movable lifting-bar 106, arranged in suitable guides 107 and provided at its lower end with an antifriction roller or wheel 108. The lifting-bar is moved verti-

cally by means of a bell-crank lever 109, which is also connected with a vertically-movable door or shield 110, adapted to cover the mouth or opening 111 of the glass-tank to protect the operator and to confine the heat within the tank, and thereby lessen the consumption of gas. The guides 107 are located at the top and bottom of the water tank or receptacle 105, and the bell-crank lever, which is fulcrumed at its angle, has a long forwardly-extending arm and is provided with a short rearwardly or upwardly extending arm. The roller 108 is arranged in the path of the forwardly-extending arm of the bell-crank lever 109 and is engaged by the same when the lever is oscillated by the carriage, as hereinafter explained. The said forwardly-extending arm of the bell-crank lever 109 is also connected by a link 110^a with the vertically-movable shield or door 110. The shield or door is provided with depending stems 112, arranged in suitable guides 113, located at a point beneath the opening or mouth 111 and extending forward from the front end of the frame of the machine. The door or shield is constructed of asbestos, and the bell-crank lever 109 is capable of simultaneously raising the forming-block and the door or shield. The upwardly-extending arm of the bell-crank lever 109 is provided with an adjustable bar or member 114, pivoted between its ends to the upper terminal of the short arm of the lever 109 and provided at its lower end with a curved arm or portion 115, having a longitudinal slot receiving a suitable fastening device 116. The fastening device 116, which is mounted on the short arm of the bell-crank lever 109, extends through the curved slot of the arm or extension 115 and is adapted to clamp the adjustable bar or member 114 in the desired position. The pivot of the bar or member 114 is preferably provided with a clamping-nut to assist in securing the said bar or member in its adjusted position. The bar or member 114, which constitutes a portion of the bell-crank lever, is arranged in the path of the pin 117, which extends laterally from the lower portion of the car, and as the latter nears the limit of its backward movement the pin 117 is carried into engagement with the adjustable member of the bell-crank lever 109, and the latter is oscillated to raise the block and the door or shield. The pivoted bar or member is capable of adjustment to cause the forming-block and the door or shield to move vertically at the proper time. As soon as the carriage moves forward and releases the bell-crank lever 109 the forming-block and the door or shield will drop automatically by gravity and will remain in such lowered positions as illustrated in Fig. 1 of the accompanying drawings while the glass-gathering instrument is being operated within the working-chamber of the glass-tank. The door or shield will remain closed and will protect the operator from the heat of the glass-

tank while the glass on the head of the gathering instrument is being worked. The forming-block receives the glass on the end of the gathering instrument, which is continuously
5 rotated until it is lifted out of the holder by the operator.

It will be seen that the inclination or pitch of the glass-gathering instrument may be readily changed by adjusting the lever 75 and
10 the hinged member or extension upon which the pivoted holder is mounted and that by changing the pitch or inclination of the gathering instrument the latter may be caused to project to a greater or less extent into the
15 glass and to gather the same at the extreme outer end of the head and to collect a maximum amount of glass on a minimum-sized head. Also it will be seen that the means for automatically changing the speed for
20 operating the carriage and for rotating the gathering instrument enable such results to be accomplished without jarring or jolting the gathering instrument or the machine. Furthermore, it will be apparent that the
25 door or shield is automatically closed to protect the operator from the heat and to confine the latter within the chamber of the tank, and thereby lessen the consumption of gas or other fuel for maintaining the contents of the
30 tank at the proper temperature. The pivotally-mounted gathering-instrument holder, which is capable of adjustment on the carriage, is automatically carried from an approximately horizontal position to an inclined
35 position as it is projected into the chamber of the glass-tank, and as the carriage moves backward it is returned to its horizontal position, and the forming-block is automatically elevated and arranged to receive the glass on
40 the instrument, which is rotated by the machine until it is removed from the holder.

What I claim is—

1. In a machine for gathering glass, the combination of a carriage, a gathering-iron holder
45 adjustably mounted on the carriage, a gathering-iron arranged on the holder, mechanism for advancing the holder to carry the gathering-iron into a glass-tank and for dipping the iron, and means independent of said mechanism and carried by the said carriage for adjusting the holder relative to the said mechanism to change the normal position of the
50 holder on the carriage to dip the gathering-iron into the glass to a greater or less extent, substantially as described.

2. In a machine for gathering glass, the combination of a carriage provided with a pivoted section, a gathering-iron holder pivotally
60 mounted on the said pivoted section, means for advancing the carriage and for dipping the gathering-iron, and an adjusting device carried by the carriage and connected with the pivoted section thereof for changing the normal position of the latter, substantially as described.
65

3. In a machine for gathering glass, the combination of a carriage, mechanism for moving the carriage to and from a glass-tank, a pivotally-mounted gathering-instrument holder carried by the said carriage, a removable
70 gathering instrument arranged in the holder, an adjusting device for changing the position of the holder, and means for automatically tilting the holder and for varying the movement of the same, substantially as and for the
75 purpose described.

4. In a machine for gathering glass, the combination of a carriage having a hinged section or member and provided with means for adjusting the same, a gathering-instrument
80 holder pivotally mounted on the member or extension, and means for moving the carriage to and from a glass-tank and for automatically tilting the holder, substantially as described.
85

5. In a machine for gathering glass, the combination of a carriage, a gathering-instrument holder adjustably mounted on the carriage, a lever connected with the holder and fulcrumed on the carriage, and a stop arranged in the path
90 of the lever and consisting of a lever fulcrumed between its ends, a spring connected with the stop-lever, and an adjusting-screw engaging the same, substantially as described.

6. In a machine for gathering glass, the combination of a carriage, a holder pivotally
95 mounted at its front end on the carriage, a gathering instrument removably arranged on the holder and extending in advance and in rear of the same, and means for automatically
100 oscillating the holder, substantially as described.

7. In a machine for gathering glass, the combination of a carriage, a holder pivotally
105 mounted at its front end on the carriage and provided with an arm, a removable gathering instrument arranged on the holder, a lever fulcrumed on the carriage and connected with the said arm, and a stop arranged in the path of the lever, substantially as described.
110

8. In a machine for gathering glass, the combination of a carriage provided with a pivoted section or member arranged at its front, means for adjusting the pivoted section or member to raise and lower the same, a holder pivotally
115 mounted at its front on the section or member, and means for automatically oscillating the holder, substantially as described.

9. In a machine for gathering glass, the combination of a carriage, a holder pivotally
120 mounted at its front and provided with anti-friction rollers or wheels forming an open bearing, a gathering instrument removably arranged in the open bearing and supported by the anti-friction rollers or wheels and provided between its ends with a gear, a gear
125 mounted on the holder and meshing with the gear of the instrument, and means for rotating the gear of the holder, substantially as described.
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10. In a machine for gathering glass, the combination of a carriage, a holder pivotally mounted at its front on the carriage and having open bearings and provided with a gear, 5 an instrument detachably arranged on the holder in the said open bearings and having a gear located near its front end and meshing with the gear of the holder, and means for rotating the latter, substantially as described.
11. In a machine for gathering glass, the 10 combination of a carriage, a hinged section or member mounted on the carriage at the front thereof and provided with a rearwardly-extending arm, an adjusting device mounted 15 on the carriage and engaging the arm to raise and lower the section or member, the holder pivotally mounted on the section or member at the front end thereof and provided at its front with a gear, an instrument arranged on 20 the holder and provided near its front end with a gear meshing with the said gear, and means for operating the said gears and for oscillating the holder, substantially as described.
12. In a machine for gathering glass, the 25 combination of a holder, mechanism for moving the same to and from a glass-tank, and a movable forming-block operated by the said mechanism to carry it to a position to receive 30 the gathered glass, substantially as and for the purpose described.
13. In a machine for gathering glass, the combination of a holder, mechanism for moving 35 the same to and from a glass-tank, a water-receptacle, a movable forming-block, and means for carrying the forming-block to and from the water-receptacle and for arranging it in position to receive the gathered glass, 40 substantially as described.
14. In a machine for gathering glass, the combination of a carriage, a gathering-instrument holder mounted on the carriage, means 45 for operating the carriage, a water-receptacle, a movable forming-block, and mechanism operated by the carriage for carrying the forming-block to and from the water-receptacle and for arranging the said block in position 50 to receive the glass, substantially as described.
15. In a machine for gathering glass, the combination of a carriage, a holder mounted 55 on the carriage, a vertically-movable forming-block, and mechanism for raising and lowering the forming-block, substantially as described.
16. In a machine for gathering glass, the combination of a carriage, a vertically-movable forming-block, and mechanism for raising 60 the forming-block, said mechanism being arranged in the path of and adapted to be engaged by the carriage, substantially as described.
17. In a machine for gathering glass, the combination of a carriage, a movable forming- 65 block, and a lever connected with the forming-block and arranged in the path of and adapted to be engaged by the carriage, substantially as described.
18. In a machine for gathering glass, the combination of a carriage, a vertically-mov- 70 able forming-block, a lifting-bar connected with the forming-block, and a bell-crank lever having one of its arms supporting the lifting-bar, the other arm of the lever being arranged in the path of and adapted to be en- 75 gaged by the carriage, substantially as described.
19. In a machine for gathering glass, the combination of a carriage, a vertically-mov- 80 able forming-block, a receptacle for water arranged to receive the forming-block, a lifting-bar connected with the forming-block, a lever supporting the lifting-bar, and an adjustable device carried by the lever and arranged 85 to be engaged by the carriage, substantially as described.
20. In a machine for gathering glass, the combination of a carriage, a vertically-mov- 90 able forming-block, a lever supporting the forming-block and adapted to move the same vertically, and an arm or bar pivotally mounted on and adjustably connected with the lever and arranged in the path of the carriage, sub- 95 stantially as described.
21. In a machine for gathering glass, the combination of a carriage, mechanism for 100 moving the carriage to and from a glass-tank, a door or shield for closing or covering the opening of the glass-tank, and means for automatically operating the door or shield to cover the said opening when the carriage is moved 105 backward and to uncover the opening when the carriage moves forward, substantially as described.
22. In a machine for gathering glass, the combination of a carriage, a door or shield 110 for covering the opening of a glass-tank, and mechanism operated by the carriage for opening and closing the door or shield, substantially as described.
23. In a machine for gathering glass, the combination of a carriage, a vertically-mov- 115 able door or shield located at the front of the machine and arranged to cover and uncover the opening of a glass-tank, a lever arranged in the path of and operated by the carriage, and means for connecting the lever with the door or shield, substantially as described.
24. In a machine for gathering glass, the combination of a carriage, a vertically-mov- 120 able door or shield, a lever arranged in the path of and adapted to be actuated by the carriage, one arm of the lever being arranged to swing vertically, and a link connecting the lever with the door or shield, substantially as 125 described.
25. In a machine for gathering glass, the combination of a carriage, a door or shield arranged to cover and uncover the opening of a glass-tank, a forming-block capable of move- 130

ment to carry it to and from a water-receptacle, and mechanism arranged in the path of and actuated by the carriage and connected with and adapted to operate the forming-block and the door or shield, substantially as described.

26. In a machine for gathering glass, the combination of a carriage, a vertically-movable door or shield, a vertically-movable forming-block, and mechanism actuated by the carriage and connected with and adapted to raise and lower the forming-block and the door or shield, substantially as described.

27. In a machine for gathering glass, the combination of a carriage, a vertically-movable forming-block, a vertically-movable door or shield, and a lever arranged in the path of and adapted to be actuated by the carriage and connected with and adapted to raise and lower the block and the door or shield, substantially as described.

28. In a machine for gathering glass, the combination of a holder, a rotary gathering instrument, a pair of reversely-arranged cones, gearing connecting one of the cones with the rotary gathering instrument, and a ring encircling one of the cones and adapted to be shifted longitudinally of the latter to vary the speed, substantially as described.

29. In a machine for gathering glass, the combination of a carriage, a holder pivoted at its front end and provided with an arm, a removable gathering instrument arranged on the holder, means for adjusting the holder to raise and lower the same to change the normal position of the gathering instrument, a lever mounted on the carriage and connected with the said arm, and a stop arranged in the path of the lever, substantially as described.

30. In a glass-gathering machine, the combination of a carriage, a holder mounted thereon, a rotary gathering instrument, the reversely-arranged cones, gearing connecting one of the cones with the gathering instrument, the shiftable device engaged by the cones, and mechanism operated by the carriage for moving the shiftable device longitudinally of the cones to vary the speed of the gathering instrument, substantially as described.

31. In a glass-gathering machine, the combination of a carriage, a rotary gathering instrument, a pair of reversely-arranged cones, gearing connecting one of the cones with the gathering instrument, a shiftable device engaging the cones, a depressible shoe arranged in the path of the carriage, and connections between the shoe and the shiftable device for moving the latter longitudinally of the cones when the shoe is actuated, substantially as described.

32. In a glass-gathering machine, the combination of a carriage, a rotary gathering instrument, a pair of reversely-arranged cones, gearing for connecting one of the cones with

the gathering instrument, a shiftable device engaging the cones and adapted to be moved longitudinally thereof, a lever connected with the shiftable device, and a depressible yieldingly-supported shoe, arranged in the path of the carriage and adapted to be actuated by the same and connected with the said lever, substantially as described.

33. In a glass-gathering machine, the combination of a carriage, a pair of reversely-arranged cones, a shiftable device engaging the cones and adapted to be moved longitudinally thereof, a lever connected with the shiftable device, a bell-crank lever connected with the said lever, and a depressible spring-supported shoe arranged in the path of the carriage, substantially as described.

34. In a glass-gathering machine, the combination of a carriage, the reversely-arranged cones, a shiftable device engaging the cones and adapted to be moved longitudinally thereof, a depressible yieldingly-supported shoe arranged in the path of the carriage and having a convex face to be engaged by the same, and connections between the shoe and the shiftable device, substantially as described.

35. In a glass-gathering machine, the combination of a frame having rails, a carriage provided with wheels engaging the rails, sprocket-gearing mounted on the frame and connected with and adapted to reciprocate the carriage, the reversely-arranged cones, one of the cones being connected with the said sprocket-gearing, and a shiftable device automatically operated by the carriage and interposed between the cones and adapted to be moved longitudinally thereof to vary the speed of the carriage, substantially as described.

36. In a glass-gathering machine, the combination of a frame, a reciprocating carriage, reversely-arranged cones, one of the cones being connected with and adapted to actuate the carriage, a shiftable device engaging the cones and adapted to be moved longitudinally thereof to vary the speed of the carriage, and means connected with the shiftable device and arranged to be engaged by the carriage for automatically reducing the speed of the latter at the ends of its backward and forward movement, substantially as described.

37. In a machine for gathering glass, the combination of a reciprocating carriage, reversely-arranged cones one of the cones being connected with and adapted to actuate the carriage, a shiftable device engaging the cones, a reciprocating rod extending longitudinally of the machine and connected with and adapted to actuate the shiftable device, said rod being provided at its front end with an arm arranged in the path of the carriage, whereby the rod will be moved forward when the carriage arrives at the front of the machine, and means operated by the backward movement of the carriage for actuating the rod at the rear end

of the movement of the said carriage, substantially as described.

38. In a machine for gathering glass, the combination of a reciprocating carriage, reversely-arranged cones, one of the cones being connected with and adapted to actuate the carriage, a shiftable device engaging the cones, a rod connected with the shiftable device and extending longitudinally of the machine, a spring for actuating the rod to move the shiftable device in one direction, and means carried by the carriage for moving the rod in the opposite direction, substantially as described.

39. In a machine for gathering glass, the combination of a reciprocating carriage, reversely-arranged cones, one of the cones being connected with and adapted to actuate the carriage, a shiftable device engaging the cones, a spring-actuated rod connected with the shiftable device and provided with an arm, a lever connected with the rod, and projections or pins mounted on the carriage and located between the arm and the lever and adapted to actuate the same, substantially as and for the purpose described.

40. In a machine for gathering glass, the combination of a carriage, reversely-arranged cones, gearing connecting one of the cones with the carriage, a shiftable device engaging the cones, a spring-actuated rod connected with the shiftable device and having an arm, an adjustable stop for limiting the movement of the rod, a lever connected with and adapted to actuate the rod, and means carried by the carriage for engaging the lever and the arm, substantially as described.

41. In a machine for gathering glass, the combination of a frame, a reciprocating carriage, sprocket-gearing connected with and adapted to actuate the carriage, a gear-wheel connected with the sprocket-gearing, spur-gearing designed to be connected with a suitable power, a shiftable pinion meshing with the spur-gearing and connecting the same with the gear-wheel, and means for shifting the pinion, said means being operated by the carriage, whereby the latter is stopped, substantially as described.

42. In a machine for gathering glass, the combination of a frame, a carriage, gearing connected with and adapted to reciprocate the carriage, one of the gears being shiftable and adapted to be thrown out of mesh to stop the carriage, and a lever connected with the shiftable gear and arranged in the path of the carriage, substantially as described.

43. In a machine for gathering glass, the combination of a frame, a carriage, sprocket-gearing connected with and adapted to reciprocate the carriage, spur-gearing for actuating the sprocket-gearing, one of the spur-

gear wheels being shiftable and adapted to be thrown out of mesh to stop the carriage, a shifting-lever carrying the shiftable gear, and a movable bar or lever mounted on the carriage and arranged to engage the shifting-lever and adapted to be disengaged therefrom, substantially as described.

44. In a machine for gathering glass, the combination of a frame, a carriage, sprocket-gearing connected with and adapted to actuate the carriage, spur-gearing connected with the sprocket-gearing, one of the spur-gears being movable and adapted to be carried out of mesh to stop the carriage, a lever having the movable gear mounted on it, a spring connected with the lever and holding the movable gear in mesh, and a movable device mounted on the carriage and arranged to engage the lever, substantially as and for the purpose described.

45. In a machine for gathering glass, the combination of a frame, a reciprocating carriage, gearing connected with the carriage for actuating the same, one of the gears being shiftable and adapted to be thrown out of mesh, a spring-actuated lever carrying the shiftable gear, and a movable device mounted on the carriage and arranged to engage the lever, substantially as described.

46. In a machine for gathering glass, the combination of a frame, a reciprocating carriage, the gear-wheel 20, gearing for connecting the gear-wheel 20 with the carriage, the central pinion 25, the shifting-lever fulcrumed at the center of the central pinion, a shiftable pinion mounted on the lever and meshing with the central pinion and adapted to be swung into and out of mesh with the gear-wheel 20, and means for operating the lever, substantially as described.

47. In a machine for gathering glass, the combination of a frame, a reciprocating carriage, a holder mounted on the carriage, a rotary gathering instrument, a motor mounted on the frame, the reversely-arranged cones disposed in pairs, one cone of each pair being connected with the motor, gearing for connecting the other cone of one pair with the rotary gathering instrument, gearing connecting the carriage with the other pair of cones, and shiftable devices engaging the cones and adapted to vary the speed, substantially as described.

In testimony that I claim the foregoing as my own I have hereto affixed my signature in the presence of two witnesses.

WILLIAM FRANCIS ALTENBAUGH.

Witnesses:

HARRY TAGGART,
M. L. BIGGER.