No. 807,889. PATENTED DEC. 19, 1905.

G. WATSON & H. W. MASON.

SYSTEM FOR THE DESTRUCTION OF REFUSE.

APPLICATION FILED JUNE 27, 1905.

7 SHEETS—SHEET 1.

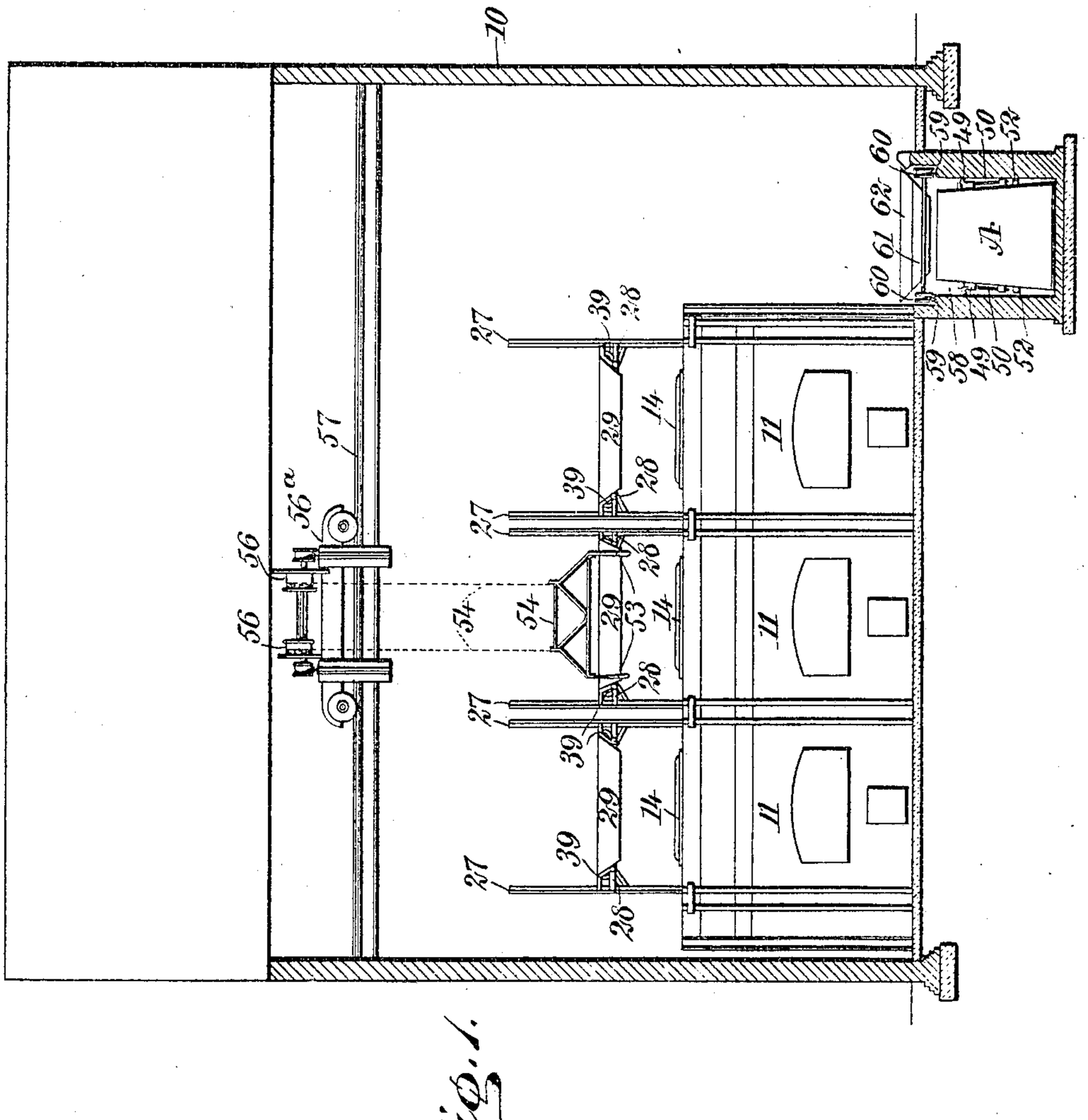

Fig. 1.

Witnesses:
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S. A. Cobb.

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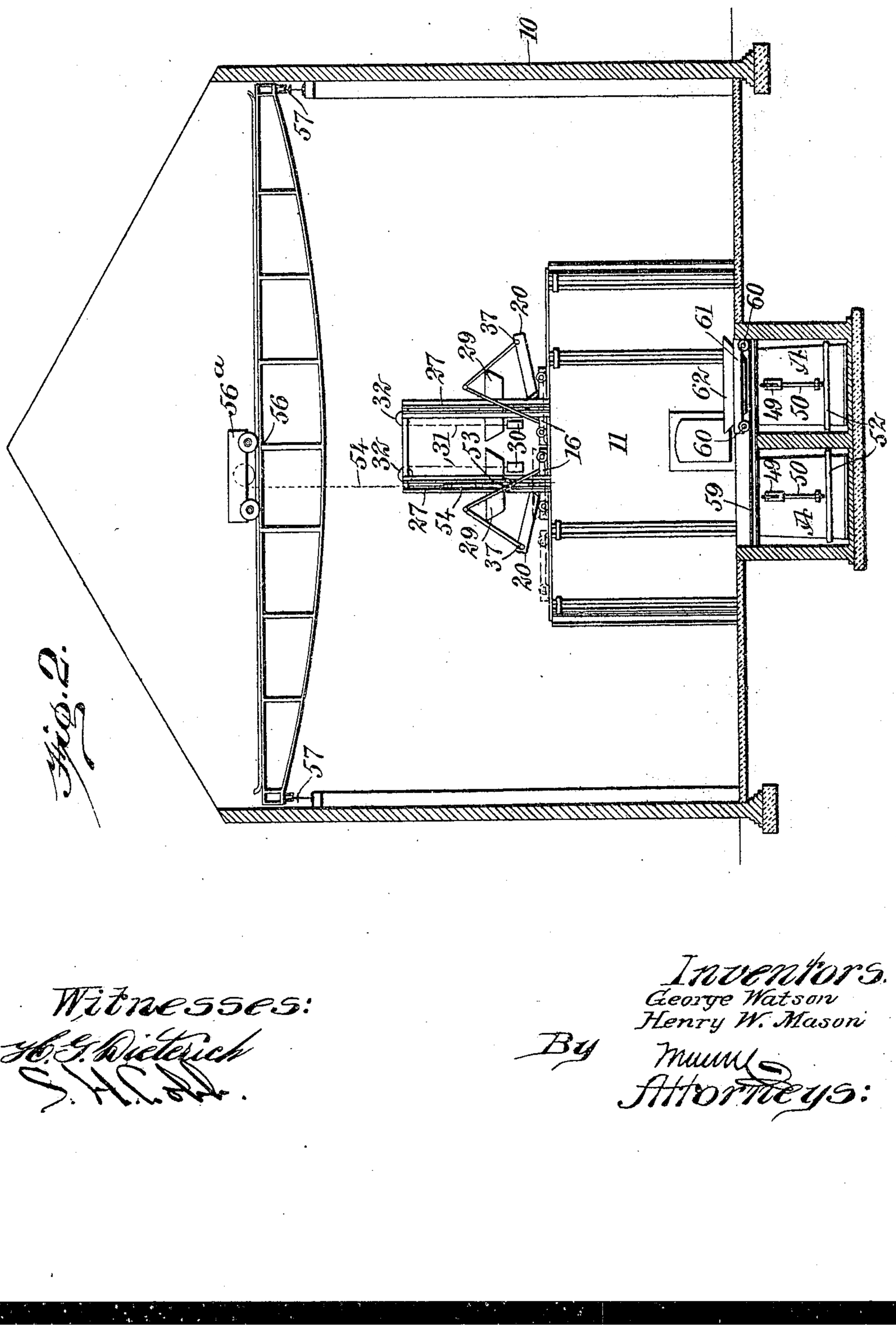

Fig. 2.

Witnesses:
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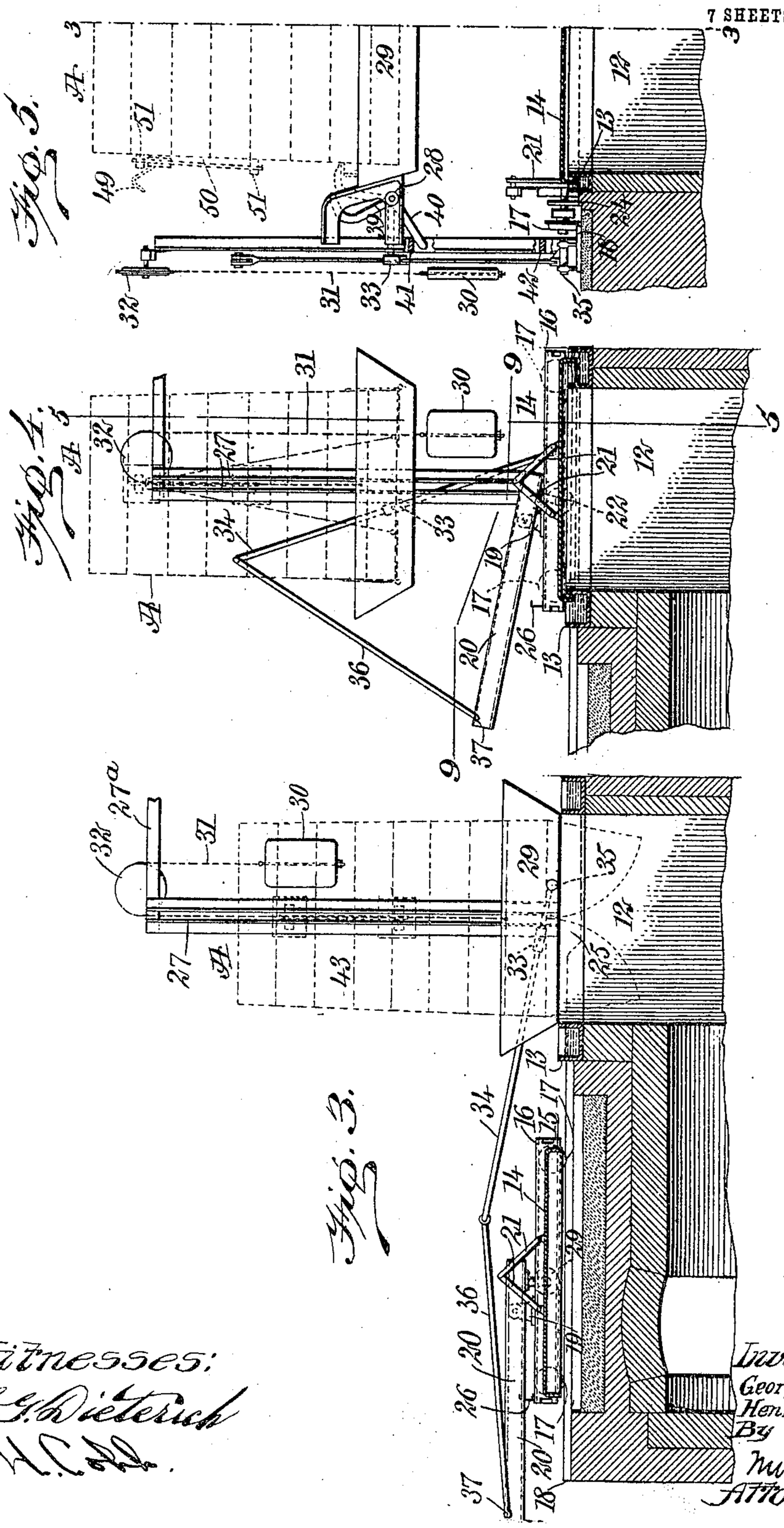

Fig. 3.

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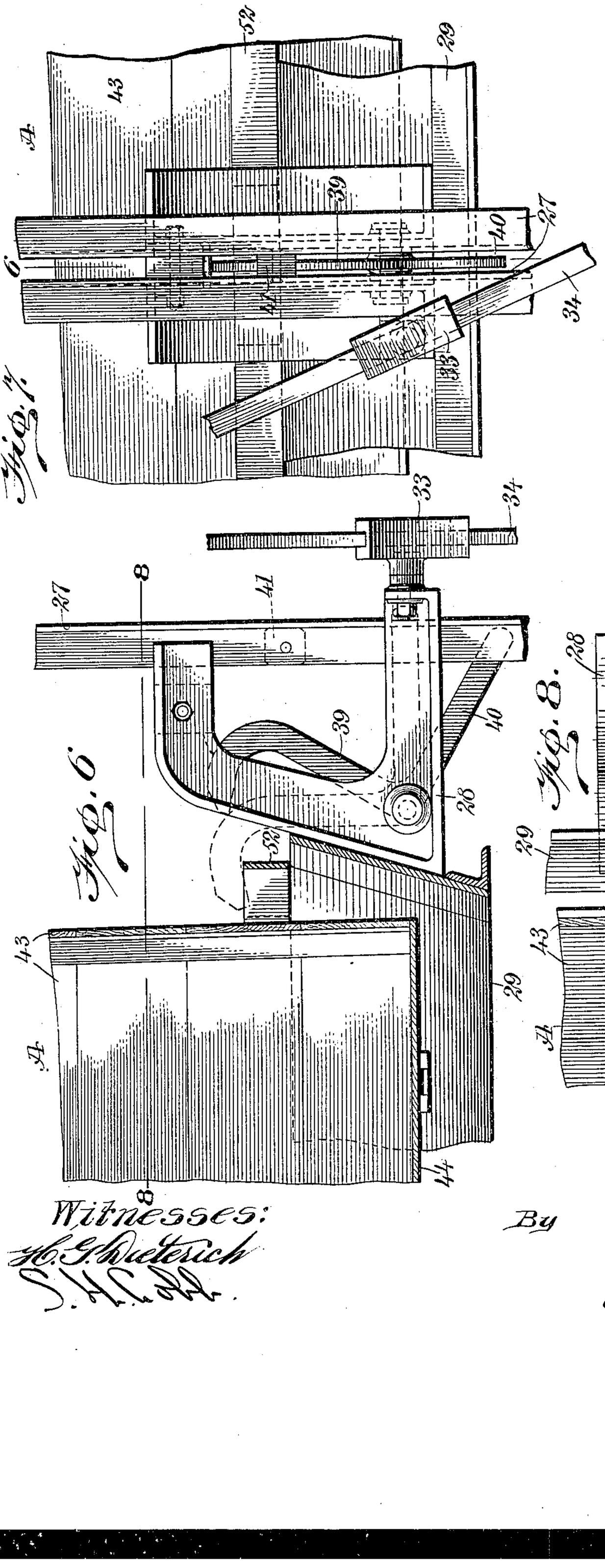

Fig. 6.

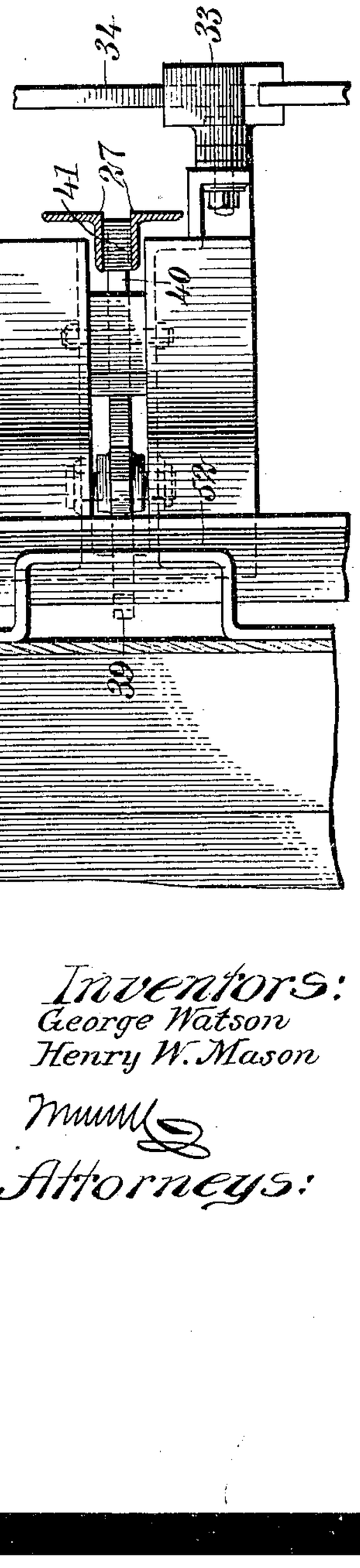

Fig. 8.

Fig. 8.

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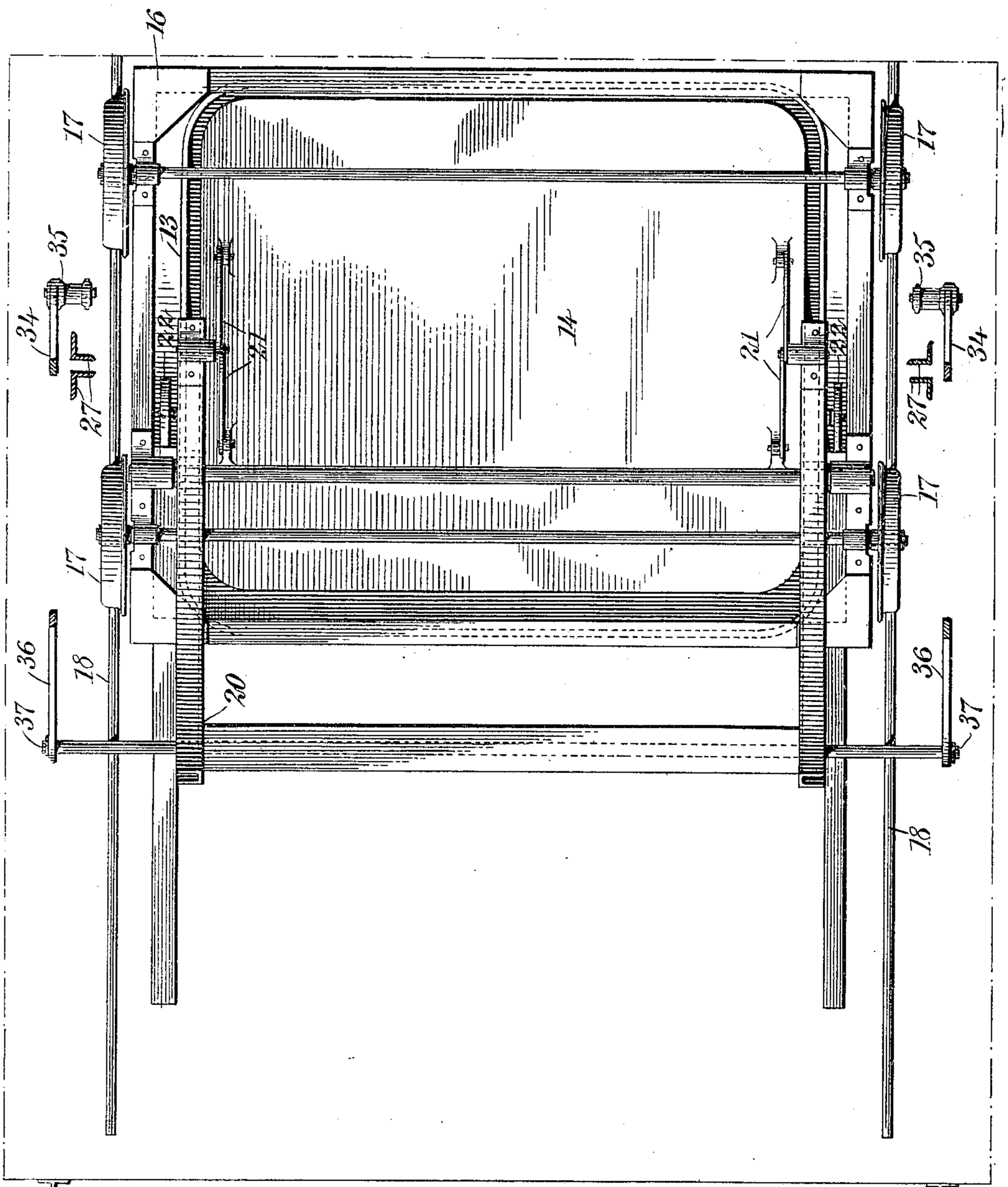

Fig. 9.

Witnesses:
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No. 807,889. PATENTED DEC. 19, 1905.

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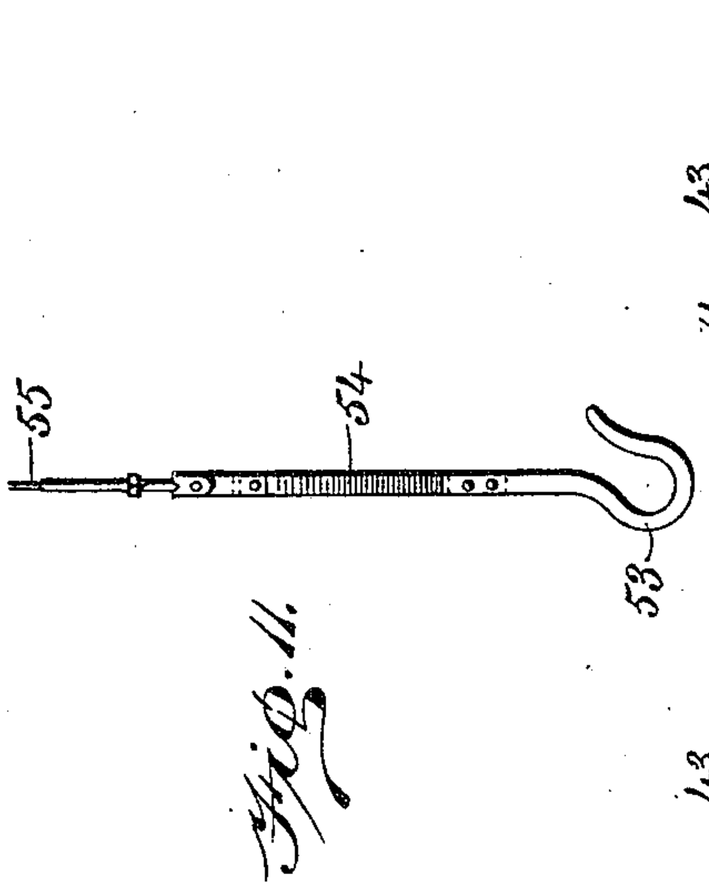

Fig. 11.

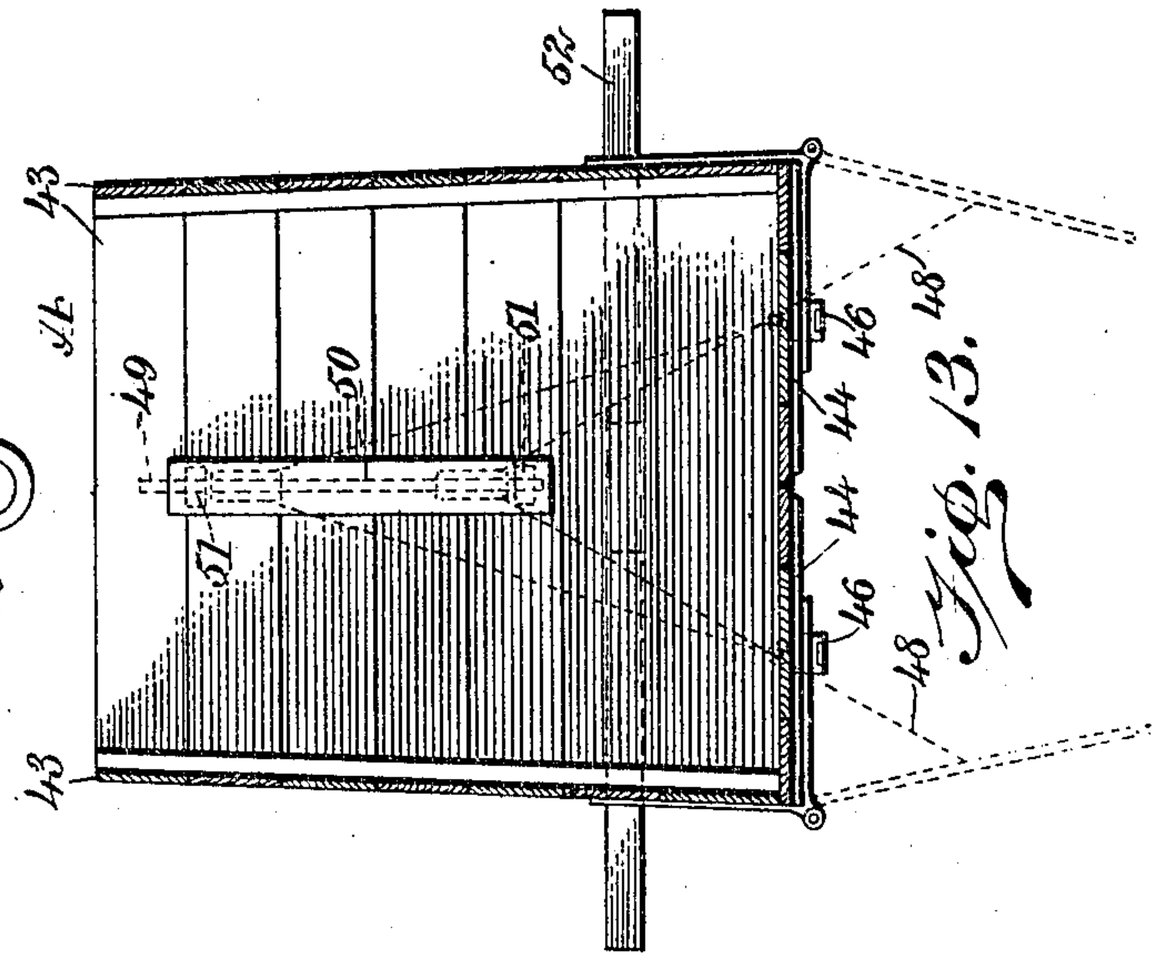

Fig. 13.

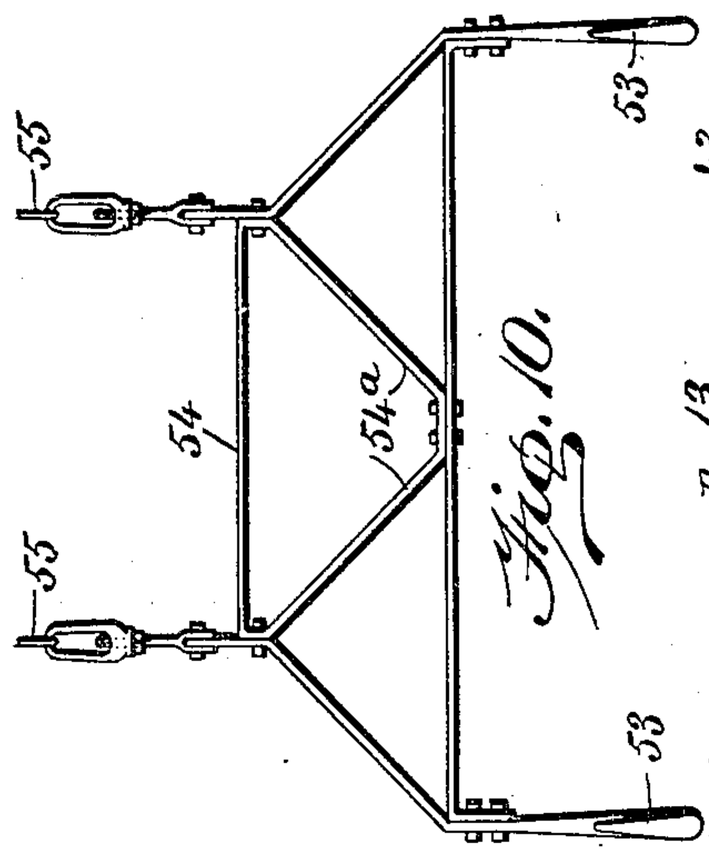

Fig. 10.

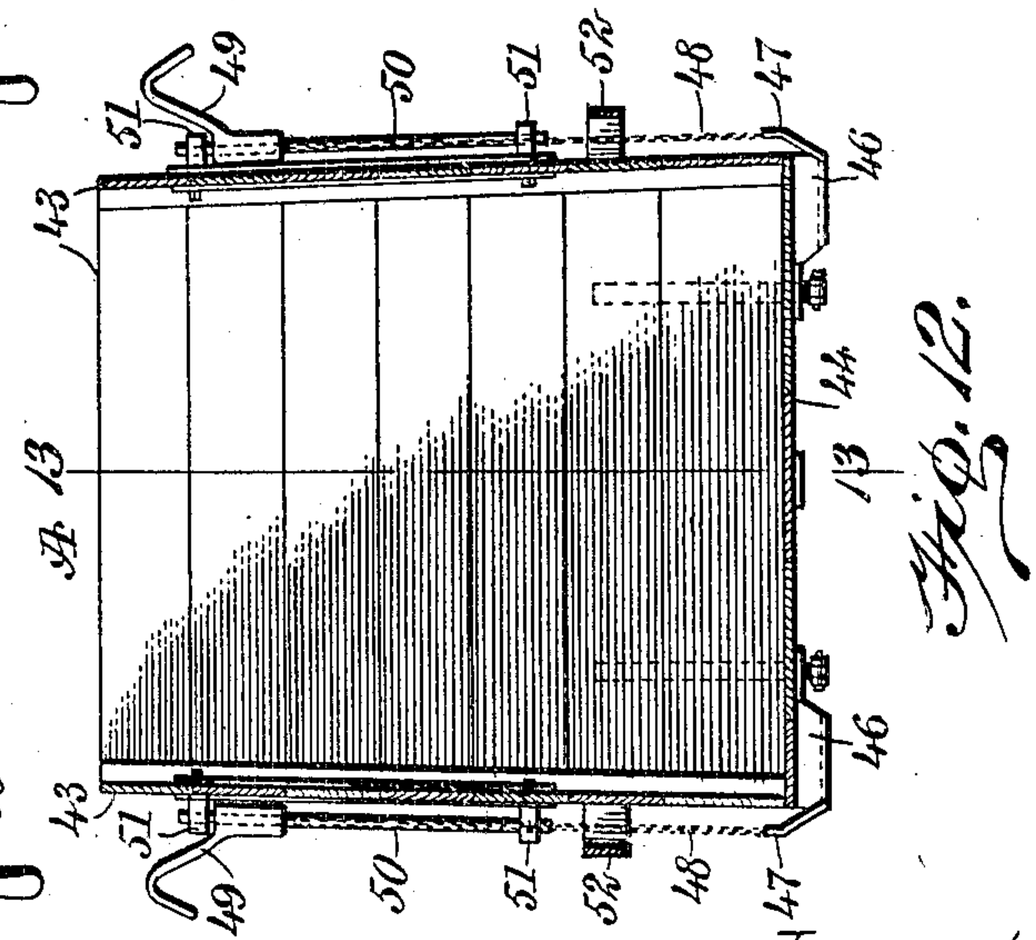

Fig. 12.

Witnesses:
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No. 807,889. PATENTED DEC. 19, 1905.

G. WATSON & H. W. MASON.

SYSTEM FOR THE DESTRUCTION OF REFUSE.

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7 SHEETS—SHEET 7.

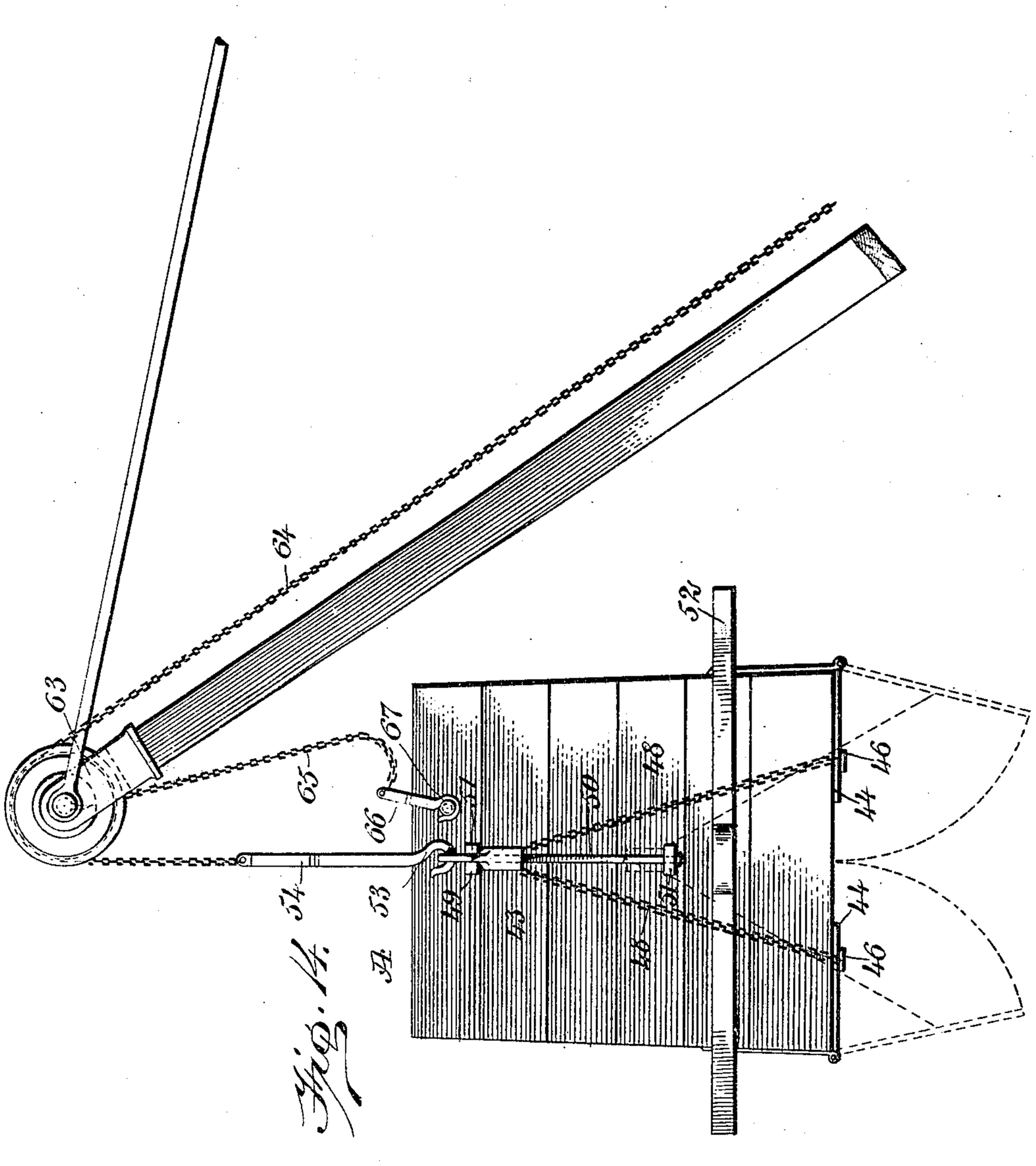

Fig. 4.

Witnesses:
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UNITED STATES PATENT OFFICE

GEORGE WATSON, OF POOL, NEAR LEEDS, AND HENRY WILLIAM MASON, OF WAKEFIELD, ENGLAND, ASSIGNORS TO HORSFALL DESTRUCTOR CO., LIMITED, OF LEEDS, ENGLAND.

SYSTEM FOR THE DESTRUCTION OF REFUSE.

No. 807,889. Specification of Letters Patent. Patented Dec. 19, 1905.

Application filed June 27, 1905. Serial No. 267,314.

To all whom it may concern:

Be it known that we, GEORGE WATSON, a resident of Pool, near Leeds, and HENRY WILLIAM MASON, a resident of Wakefield, England, subjects of the King of Great Britain, have invented a new and Improved System for the Destruction of Refuse, of which the following is a full, clear, and exact description.

Our invention relates to systems for destroying street and house refuse and the like, and more particularly to those in which the material is delivered to furnaces in bulk. Its principal object is to provide an effective system for this purpose.

Reference is to be had to the accompanying drawings, which form a part of this specification, in which similar reference characters designate similar parts in all the views.

Figure 1 is a vertical longitudinal section through a building in which is installed one embodiment of our improved system. Fig. 2 is a transverse section through said building. Fig. 3 is a broken longitudinal section through one of the furnaces, it being taken on the line 3 3 of Fig. 5. Fig. 4 is a similar view, but showing the movable elements in another position. Fig. 5 is a section on the line 5 5 of Fig. 4. Fig. 6 is an enlarged sectional detail taken on the line 6 6 of Fig. 7 and illustrating the latch mechanism of the hopper and more closely associated elements. Fig. 7 is an end elevation of this portion of the system. Fig. 8 is a horizontal section on the line 8 8 of Fig. 6. Fig. 9 is an enlarged section on the line 9 9 of Fig. 4. Figs. 10 and 11 are respectively side and end elevations of a carrier for the container. Fig. 12 is a central vertical section through said container. Fig. 13 is a similar view on the line 13 13 of Fig. 12, and Fig. 14 illustrates the container as supported upon a different form of crane from that included in Figs. 1 and 2.

10 designates a suitable building, in which are arranged batteries of furnaces 11, each of which is provided with a feed throat or opening 12. These furnaces may be of any type suitable for the cremation of refuse, and as they are preferably identical in character but one will be referred to in the following description. About the furnace-opening is a trough 13, adapted to contain a liquid, and thus furnish a water seal for a closure. This closure is provided by a door 14, having a flange 15 extending about it and of such length that it may project into the liquid in the trough. The door is mounted upon a car or carriage 16, which is conveniently in the form of an open frame supported upon pairs of wheels 17 17, operating over rails 18, situated at each side of the opening and extending beyond it upon the top of the furnace. Rising from the car are opposite brackets 19, between which is fulcrumed a lever or frame 20, pivotally connected to the door by converging suspension-rods 21. The weight of the lever is preferably such that it nearly counterbalances the door, the excess of weight of the latter being carried by opposite rolls 22, rotatable in brackets 23 and running over tracks 24, parallel to the rails 18. In these tracks, adjacent to the furnace-throat, are depressions 25, serving to receive the rolls when the door is positioned with its flange over the trough, thus allowing it to be lowered into place. A stop 26, projecting above the car at the opposite end from the rail depressions, serves to limit the movement of the lever in this direction.

Rising from each side of the furnace-opening outside the rails are standards 27, each of which preferably comprises separated angle-irons and which are connected at their tops by a cross-bar 27[a]. Guided by these standards are double brackets 28, projecting from a hopper or movable member 29, which may be balanced by weights 30, secured to the ends of chains 31, which pass over pulleys 32, rotatable at the top of the standards, and are connected below these pulleys to the hopper. Pivotally mounted upon each of the brackets is a guide 33, through which is movable a link 34, pivotally joined to the furnace at one extremity through a bracket 35 and articulated at its outer end to a link 36, which is pivoted to the lever 20 at 37. Fulcrumed at 38 between the sections of each of the brackets 28 is a latch 39, having an arm 40 extending outwardly between upper and lower stop members 41 and 42, respectively, fixed between the angle-irons of the standards.

The hopper is adapted to receive a container A for the refuse to be destroyed. This container comprises side walls 43, which are shown as diverging downwardly to facilitate free delivery. At the bottom of the walls, at opposite sides, are hinged discharge-doors 44,

which have fixed near their outer edges blocks 46, which when in contact with the supporting-surface hold the doors closed. Projecting from each of the blocks beyond the walls of the container are arms 47, from which flexible members or chains 48 converge to attaching devices or hooks 49. Each of these hooks has a vertical opening to receive a guide-rod 50, supported near its ends by brackets 51, bolted to the container-walls. Horizontal angle-bars 52 are shown as fastened to the container below the guide-rods. These bars when the container is introduced into the hopper may rest upon its sides to move said hopper downwardly and to support the container when these elements are in their lowest position. It also serves as a contact member for the latch 39, thus constraining the hopper and container to travel together when the latter is raised. With the attaching devices coöperate separated hooks 53 53, depending from a carrier-frame 54, which may be suitably braced by inclined members 54[a]. Secured at separate points upon the upper side of the carrier-frame are chains or flexible members 55, which extend upwardly over a pair of drums 56 56 of some suitable traveling crane or lifting means 56[a], movable upon rails 57, extending between the walls of the building above the furnaces. The crane and carrier serve to transfer the containers to the furnace from a receiver or support, which is illustrated as consisting of a pit 58, situated below the floor of the building and at one side of and between the batteries of furnaces. At the top of this pit and at opposite sides are carried tracks 59, over which operate wheels 60 of an open car 61, carrying a hopper 62. As shown, the pit is sufficiently large to receive two of the containers, and the hopper may be moved upon the track into vertical alinement with either of them or be positioned at one side to permit their withdrawal.

In using our system the refuse to be destroyed is brought by cars or the like to the pit or other point where the containers may be located. The blocks of these containers rest upon the bottom of the pit or other supporting-surface and maintain the discharge-doors closed. The hopper is now moved over the container which is to receive the charge, and the cars dump their contents into it until the desired amount has been introduced. The carrier being lowered by the crane until its hooks are below the container-hooks, these are brought into alinement and the carrier raised. The tension thus placed upon the discharge-doors through the connecting-chains holds them closed, and the container, with its contents, is thus lifted and moved over the feed-opening of the furnace which is to be supplied, said opening being closed by its door. The carrier is now allowed to fall between the standards until its side bars contact with the hopper, which is in its raised position, Figs. 4 and 5, and moves it before it. This causes the guides 33 to travel over the links 34, depressing the link 36 and the outer end of the lever, and consequently raising the door above the trough. At this time the lever contacts with the stop upon the carriage, and the continued movement of the link 34 causes its companion link to approach a horizontal position, forcing the car outwardly and moving the door to one side of the feed-opening, Fig. 3, the rolls 22 moving over their tracks and supporting the lever and door at this end. After this has been accomplished the bottom of the hopper strikes the wall above the feed-opening, and the weight of the container is supported upon said hopper. This relieves the tension upon the suspending members, and the doors are freed and allowed to swing to a vertical position, the contents falling into the furnace. As the hopper approaches its lowest position the arms of the latches contact with the stop 42, causing the hooks to move over the container-bars, thus locking said container and the hopper. The container having been emptied of its contents, it is raised by the crane and carrier and by virtue of the engagement of the latches draws the hopper upwardly with it. This moves the links 34 and 36 toward their original position, resulting in a reversal of the movements previously described, the car being first caused to travel toward and over the furnace-opening and the door being finally lowered, with its flange extending below the surface of the water in the trough, thus sealing the opening. When the hopper is in proximity to its initial position, its latches strike the stops 41, swinging the hooks outwardly and releasing the container, which is then drawn up sufficiently to clear the standards, when it may be carried by the crane to a point above the pit and lowered into it. The container is now ready to receive another charge. It will be obvious that the containers need not be filled within the structure inclosing the furnaces, but may be mounted upon a suitable supporting-surface at some distant point, from which they may be transported in any convenient manner.

Instead of delivering the refuse to furnaces the containers may be employed for discharging their contents into other receivers, as vessels, and in this connection it might not be desirable to lower them upon a support which will take their weight from the suspending members, so that the doors will open. In Fig. 14 of the drawings we have illustrated a jib-crane 63, which has in addition to its main chain or cable 64 auxiliary cables 65, which have hooks 66 engaging projections 67 from the containers. The upper extremities of these cables 65 are fast to the crane, and they are of such length that when the container has been lowered to the desired extent they

support its weight and allow the doors to open.

Having thus described our invention, we claim as new and desire to secure by Letters Patent—

1. A system for the destruction of refuse, comprising a container, a furnace provided with a feed-opening, a door for closing the opening, a vertically-movable hopper above the opening for supporting the container, and connections between the hopper and the door whereby the movement of the hopper toward the door may first lift the same perpendicularly, and afterward move the same to one side.

2. A system for the destruction of refuse, comprising a furnace provided with a feed-opening, a door for closing the opening, a vertically-movable hopper above the opening, and connections between the hopper and the door, whereby the movement of the hopper toward the door may first lift the same perpendicularly and afterward move the same to one side.

3. A system for the destruction of refuse comprising a container having discharge-doors, a support for a plurality of containers coöperating with the doors to hold them closed for filling, a hopper movable over both of the containers, and a furnace to which the containers are transferred from the support and to which they deliver.

4. A system for the destruction of refuse, comprising a container, a furnace provided with feed-openings, a door for closing the opening, a carriage for supporting the door, a vertically-movable hopper above the opening for supporting the container, and connections between the hopper and the door, whereby the movement of the hopper toward the door may lift the same perpendicularly, and connections between the door and the carriage whereby the continued movement of the hopper may move the carriage to one side of the opening.

5. A system for the destruction of refuse comprising a container, a furnace provided with a feed-opening, a closure for the opening, a hopper situated above the opening and adapted to support the container, connections between the hopper and closure, and means for temporarily securing the container and hopper together.

6. A system for the destruction of refuse comprising a container, a furnace provided with a feed-opening, a closure for the opening, a hopper situated above the opening and adapted to support the container, connections between the hopper and closure, and a latch mounted upon the hopper and movable into engagement with the container.

7. A system for the destruction of refuse comprising a container, a furnace provided with a feed-opening, a closure for the opening, a hopper situated above the opening and adapted to support the container, connections between the hopper and closure, a latch mounted upon the hopper and movable into engagement with the container, and a stop situated in the path of the latch.

8. A system for the destruction of refuse comprising a container, a furnace provided with a feed-opening, a closure for the opening, a hopper situated above the opening and adapted to support the container, connections between the hopper and closure, a latch mounted upon the hopper and movable into engagement with the container, and stops situated at the opposite extremities of the path of the latch.

9. The combination with a furnace provided with an opening, of a carriage, a lever fulcrumed upon the carriage, and a door pivoted upon the lever.

10. The combination with a furnace provided with an opening, of a carriage, a lever fulcrumed upon the carriage, a support for the lever independent of the carriage, and a door pivoted upon the lever.

11. The combination with a furnace provided with an opening, of a member mounted above the opening and being movable toward and from said opening, a carriage, a door movable upon the carriage, and connections between the member and door.

12. The combination with a furnace provided with an opening, of a member mounted above the opening and being movable toward and from said opening, a container supported by said member, a carriage, a door movable upon the carriage, connections between the member and door, and a latch on said member coöperating with the container.

13. The combination with a furnace provided with an opening, of a member mounted above the opening and being movable toward and from said opening, a container supported by said member, a carriage, a door movable upon the carriage, connections between the member and door, a latch coöperating with the member, and relatively fixed stops for contact with the latch on said member.

14. The combination with a furnace provided with an opening, of a member mounted above the opening and being movable toward and from said opening, a carriage, a door movable upon the carriage, a guide pivoted upon the member, and a link movable through the guide, said link being connected with the door and with a relatively fixed point.

15. The combination with a furnace provided with an opening, of a member mounted above the opening and being movable toward and from said opening, a carriage, a lever fulcrumed upon the carriage, a door pivoted to the lever, a guide pivoted upon the member, and a link movable through the guide, said link being connected with the lever and with a relatively fixed point.

16. The combination with a furnace pro-