(No Model.) 2 Sheets—Sheet 1.

W. H. H. STEVENSON.

CAN FILLING MACHINE.

No. 314,352. Patented Mar. 24, 1885.

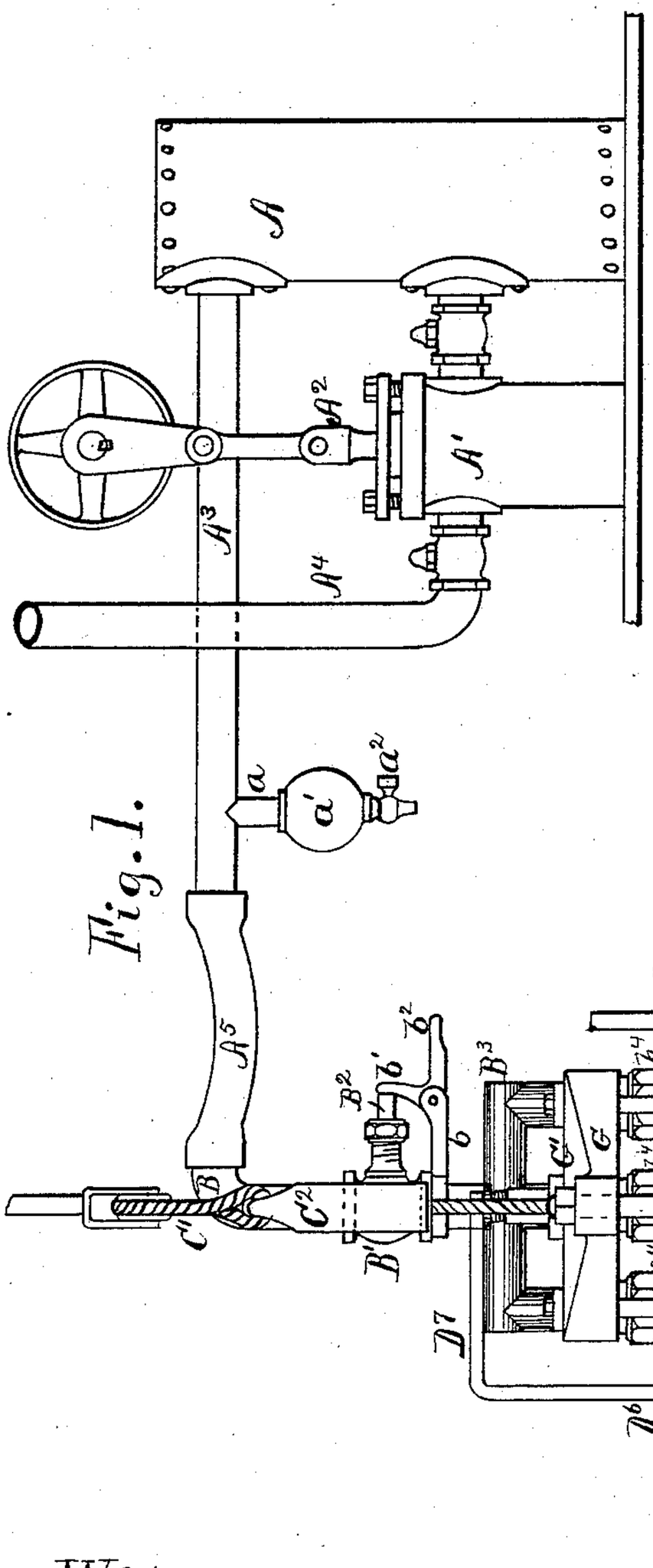

Fig. 1.

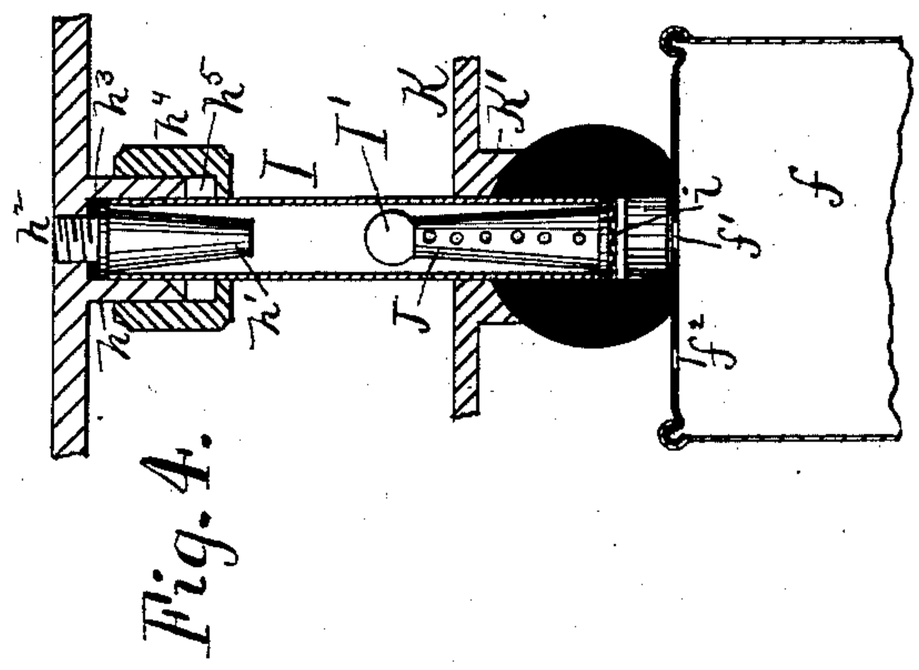

Fig. 4.

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Fig. 3.

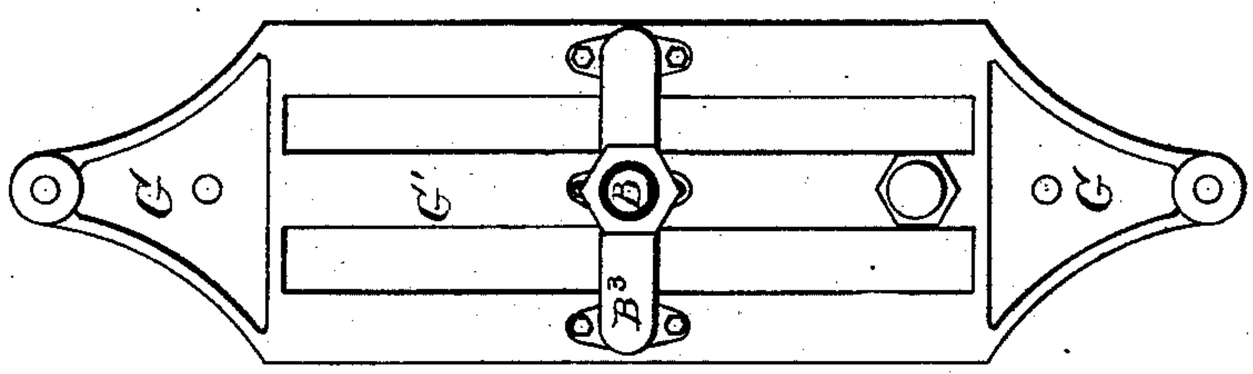
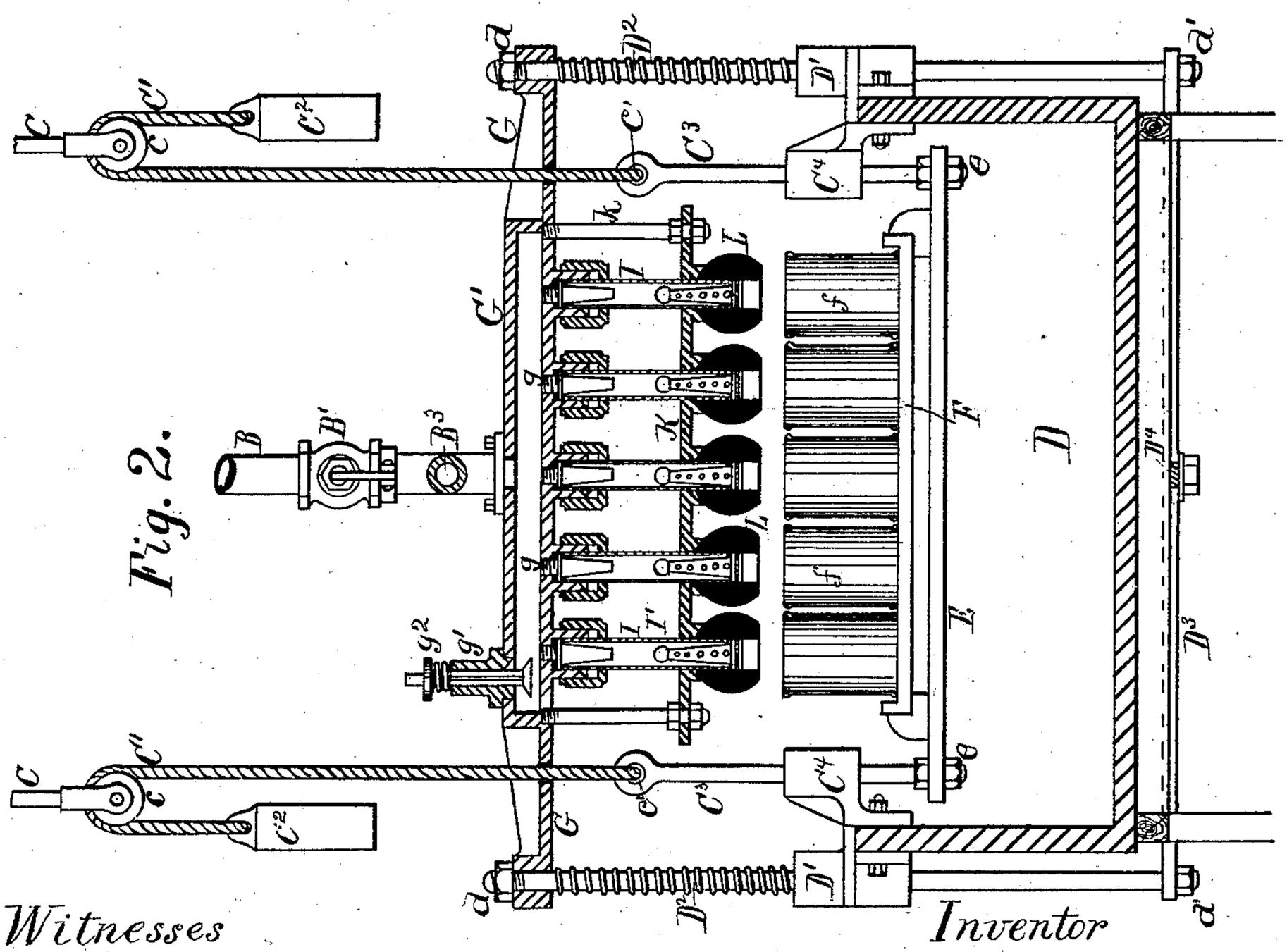


Fig. 2.



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UNITED STATES PATENT OFFICE.

WILLIAM H. H. STEVENSON, OF BALTIMORE, MARYLAND.

CAN-FILLING MACHINE.

SPECIFICATION forming part of Letters Patent No. 314,352, dated March 24, 1885.

Application filed April 10, 1884. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM H. H. STEVENSON, a resident of Baltimore city, Maryland, have invented certain new and useful Improvements in Can-Filling Machines, of which the following is a specification, reference being had to the accompanying drawings, forming part hereof, in which—

Figure 1 is an end elevation of my improved machine, showing mechanism for exhausting the air in connection therewith. Fig. 2 is a central longitudinal vertical section of the machine. Fig. 3 is a top plan view, the ropes and pulleys being omitted; and Fig. 4 is a sectional detail.

Like letters of reference mark the same parts in all the figures.

My invention relates to machines for filling cans with liquids; and it consists in the construction, arrangement, and combination of parts, which will be first fully described, and afterward pointed out specifically in the claims.

Referring to the drawings by letter, A is the tank; A′, the cylinder; A^2, the piston; A^3, the pipe through which air enters the tank, and A^4 the pipe through which the air is exhausted.

The pipe A^3 communicates with the filling-machine by means of a flexible section, A^5, and is provided with a small branch pipe, *a*, leading vertically downward, and communicating with a reservoir, *a′*, having a valve, a^2, in its bottom.

B is the pipe (attached to the machine) with which the flexible section A^5 is connected, and it is furnished with a valve, B′, having a stem, B^2, and which is normally closed.

To any suitable support overhead are attached two rods, C, having each a pulley, *c*, in its forked end, over which passes a rope, C′, whose outer end carries a weight, C^2, and whose inner end is attached in an eye, *c′*, on the end of a rod, C^3, which passes through a bracket, C^4, attached to the upper portion of the end walls of a tank, D, and is at its lower end passed through a plate, E, being secured thereto by nuts *e*. Upon this plate E, on suitable supports, rests a pan, F, in which the cans, *f*, to be filled are placed.

The machine as here illustrated has a capacity of fifteen cans at once, and this pan is consequently of sufficient size to receive them, being placed in three rows of five each. The tank D has secured to the end walls another pair of brackets, D′, through which pass rods D^2, which are secured at their upper ends to a plate, G, by nuts *d*, and at their lower ends to a bar, D^3, by means of nuts *d′*. This bar D^3 passes under the tank D, and has secured to it a treadle, D^4, which treadle is pivoted at d^2, and in bearing attached to the bottom of the tank D.

Secured to one side of the tank D is an upright projection, D^5, and to the other side an upright, D^6, having its upper end, D^7, bent at right angles thereto. The plate G in its central portion is formed into a tank, G′, which communicates through the pipe B with exhaust-tank A. The pipe B may be divided into a number of branches, as may be desired, each branch communicating with the tank G′. The bottom of the tank G′ contains as many perforations *g* as there are cans to be filled at one operation. Each of these perforations is surrounded (see Fig. 4) by a projecting nipple, *h*, cast or otherwise formed onto the bottom of the tank, the nipples having an interior diameter slightly greater than the diameter of the opening *g*. A tapered nozzle, *h′*, is provided with a threaded end, h^2, which screws into the perforation *g*, and between a shoulder on it and the bottom of the tank is a packing, h^3.

Secured within the nipples *h*, and surrounding the tapered nozzle *h′*, is a glass tube, *i*. Around this glass tube is fitted a cup-nut, h^4, which is threaded onto the outside of the nipple *h*, and is provided with a packing, h^5. When this threaded cup-nut h^4 is tightened up, the packing h^5 is expanded laterally and tightly hugs the glass tube. The glass tubes near their lower ends pass through the plate K, having downward-projecting nipples K′, and secured to plate G by bolts *k*. The lower ends of tubes I pass into rubber balls L, and have secured thereon proper sieves or perforated plates, *i*. Within the tubes are tapered perforated pipes J, having their small ends upward. Also within the tubes are floating ball-valves I′. Secured to the pipe B below the valve B′ is a bracket, *b*, which has pivoted

in its outer end an elbow-lever, one arm of which is marked b' and the other b^2.

In a nipple, g', projecting from the top of the tank G′ is arranged a valve, g^2, which is held normally closed by means of a spring. The cam f (see Fig. 4) is provided with two openings, $f' f^2$.

The operation of my machine may be described as follows, viz: The cans having been placed in position on the pan F, having been previously partially filled with solid material, and the tank D having been filled with the liquid, the plate G and its contents are lowered, bringing the rubber balls into contact with the cans. The further movement downward of the plate G and its attachments carries the plate E and the cans supported thereon into the tank D until the cans are fully immersed in the liquid. The pump is now started, exhausting the air in the exhaust-tank A and all the parts communicating with it, including the cans. As the air passes out of the can through the opening f' the liquid rushes in to take its place through the opening f^2. The continual operation of the pump carries the liquid into the tube I, and when it is sufficiently raised therein the floating ball-valves will be carried up until they lodge against the lower end of the tapered nozzles h', closing said nozzles. This fact may be observed through the glass tube I, and when all the balls have been raised the further action of the pump will create a vacuum in the tank G′, which will open the valve g^2 against the action of the spring, allowing the air to pass in, and thus relieve pressure on the valves I′. When the plate G and its attachments were first lowered, the valve B′ was opened by the arm b^2 of the elbow-lever striking the projections D^5, and causing the arm b' of said elbow-lever to press the stem B^2 of the valve inward. After the cans have been filled, as before stated, the plate G and its attachments are raised until the stem of the valve g^2 strikes the horizontal arm D^7 of the projection D^6, pressing the valve farther open and holding it so. This will destroy the partial vacuum existing in the tank G′ (the valve B′ having resumed its normally-closed position) and cause the liquid in the pipes I to escape at the bottom, whereby the valves I will again take their lower position on top of the perforated pipes J, as shown in Figs. 2 and 4. The cans may now be lifted out of the liquid by raising their supporting-plate E, and removed therefrom. Any liquid that may by accident have been drawn into the pipes B and A^3 may be let out by opening the valve a^2.

Having thus described my invention, what I claim is—

1. In a can-filling machine, the combination of a liquid-tank, a movable can-holder, an exhausting apparatus, pipes communicating between the cans on the holder and the exhausting apparatus, and provided with valves, and mechanism for immersing the cans and their holder in the liquid in the tank, as and for the purpose set forth.

2. The combination of an air-exhausting apparatus, a pipe, A^3, the flexible pipe A^5, the pipe B, and the movable valve-carrying plate G, as and for the purpose set forth.

3. The combination of the plate G, adapted to be raised and lowered, the pipe B, carried thereby and provided with valve B′, the liquid-tank D, and the projections D^5, as and for the purpose set forth.

4. The combination of the plate G, adapted to be raised and lowered, valve g^2, carried thereby, the liquid-tank D, the projection D^6, attached thereto, and the horizontal bar D^7, as and for the purpose set forth.

5. The combination of the tank G′, the glass tube secured thereto, the nozzle h', tapered perforated pipe J, and the ball-valve I′, as and for the purpose set forth.

6. The combination of the tank G′, having perforated bottom, the nipples h, projecting downward therefrom, the nozzle h', threaded to the perforated glass tube I, the cup-nut h^4, and the packing h^3 h^5, as and for the purpose set forth.

7. The combination of the tank G′, having perforated bottom, the glass tubes I, secured to said bottom and communicating with said perforations, the plate K, having nipples K′, and the rubber ball-valve, as and for the purpose set forth.

8. The combination of the plate E, adapted to support the cans to be raised and lowered, the tank G′, pipe B, attached thereto, and communicating with the exhaust mechanism, and tubes I, connecting with the cans carried by the plate E, as and for the purpose set forth.

9. The combination of the liquid-tank-carrying bracket C^4, the plate E, for supporting the cans, the rods C^3, and the counterpoise-weights C^2, as and for the purpose set forth.

10. The combination of the liquid-tank, the tank G′, connecting with the exhaust mechanism and with the cans, rods D^2, cross-bar D^3, and treadle D^4, as and for the purpose set forth.

11. The combination of the tank G′, having connection with exhausting mechanism and with the cans, and adapted to be raised and lowered, the can-supporting plate, also adapted to be raised and lowered, and the liquid-tank, as and for the purpose set forth.

12. The combination of the liquid-tank-carrying brackets C^4 and D′, the can-supporting plate E, rods C^3, counterpoise-weight C^2, the tank G′, and rods D^2, as and for the purpose set forth.

13. The combination of the can-supporting plate, counterpoised as set forth, the plate G, adapted to be raised and lowered, and a series of pipes, I, carried by said plate G, and having communication with the exhaust apparatus, as and for the purpose set forth.

14. In combination, an exhausting appa-

ratus, pipes communicating between it and the cans, a can-holder, a liquid-tank adapted to receive the cans, and automatic valve-operating devices brought into action by the raising and lowering of the can-holder, as set forth.

In testimony whereof I have hereunto set my hand in the presence of two subscribing witnesses.

WILLIAM H. H. STEVENSON.

Witnesses:
J. MASON GOSZLER,
S. BRASHEARS.