(No Model.)

2 Sheets—Sheet 1.

J. E. & W. S. REYNOLDS.

CAN TESTING MACHINE.

No. 330,924. Patented Nov. 24, 1885.

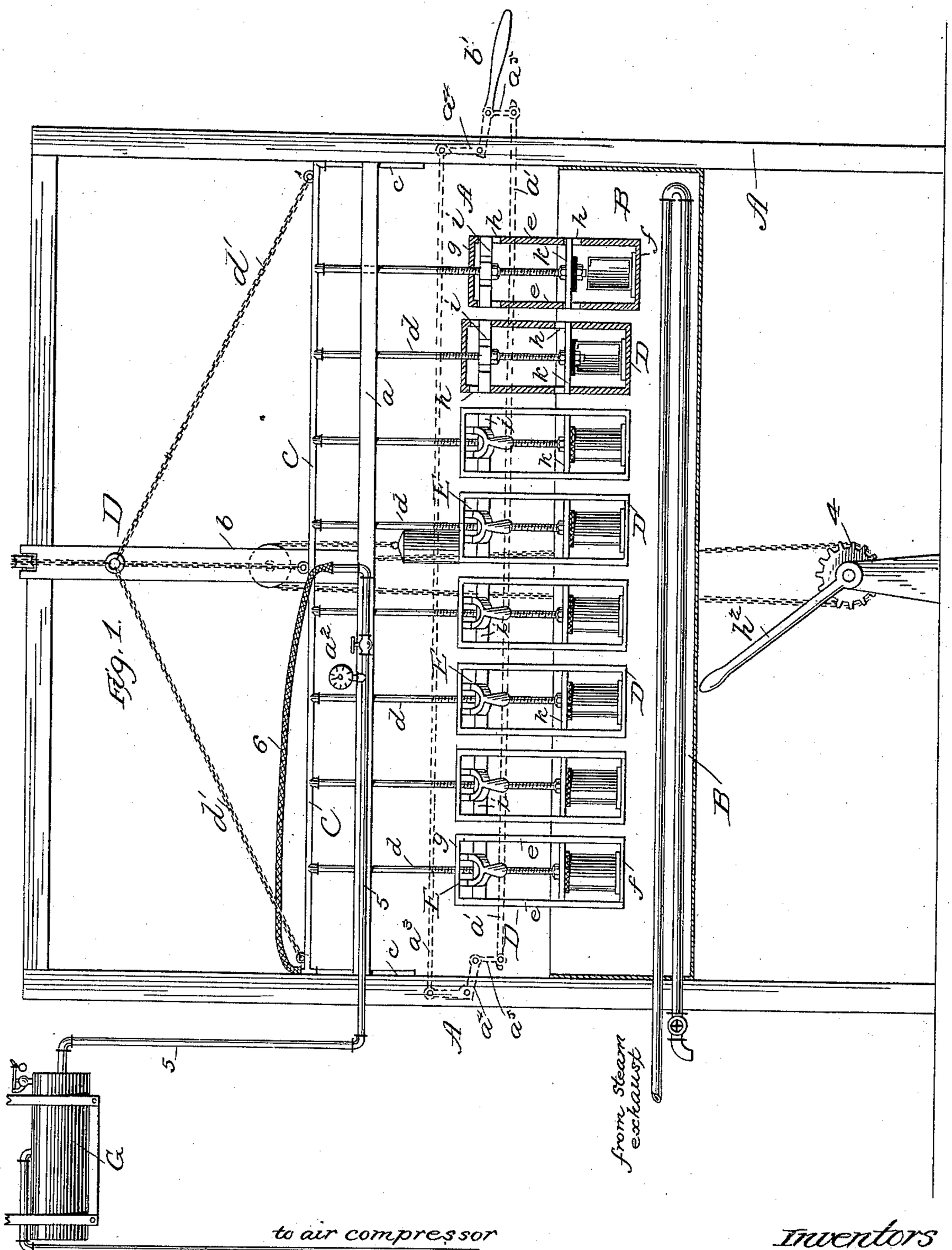

Fig. 1.

Attest,
Walter Donaldson
F. L. Middleton

Inventors
J. E. Reynolds
by W. S. Reynolds
Joyce & Spear
Atty's.

(No Model.) 2 Sheets—Sheet 2.

J. E. & W. S. REYNOLDS.

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Fig. 6.

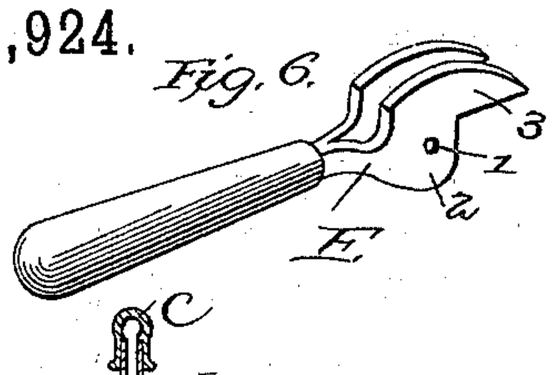


Fig. 3.

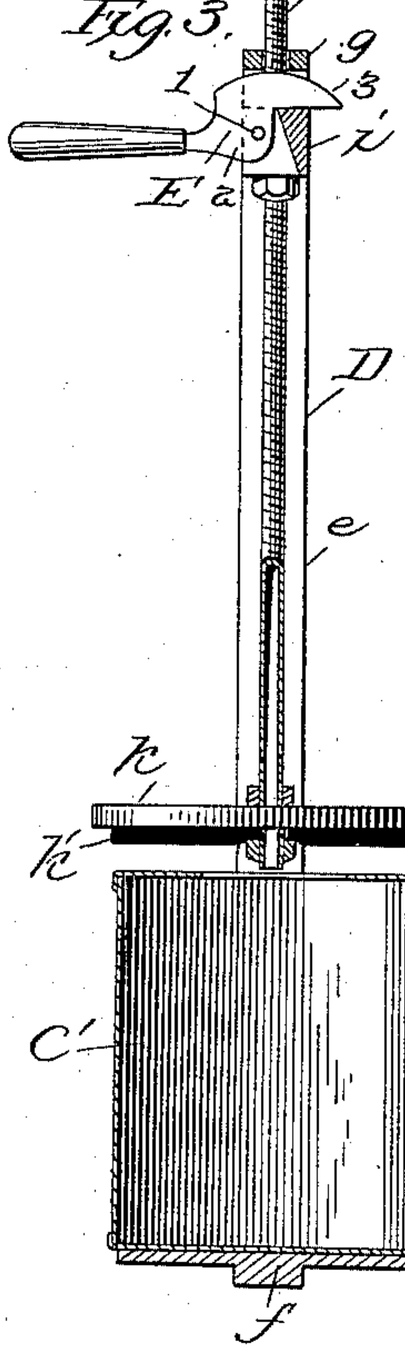


Fig. 4.

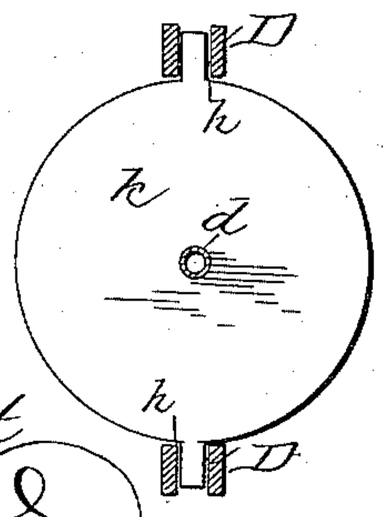


Fig. 2.

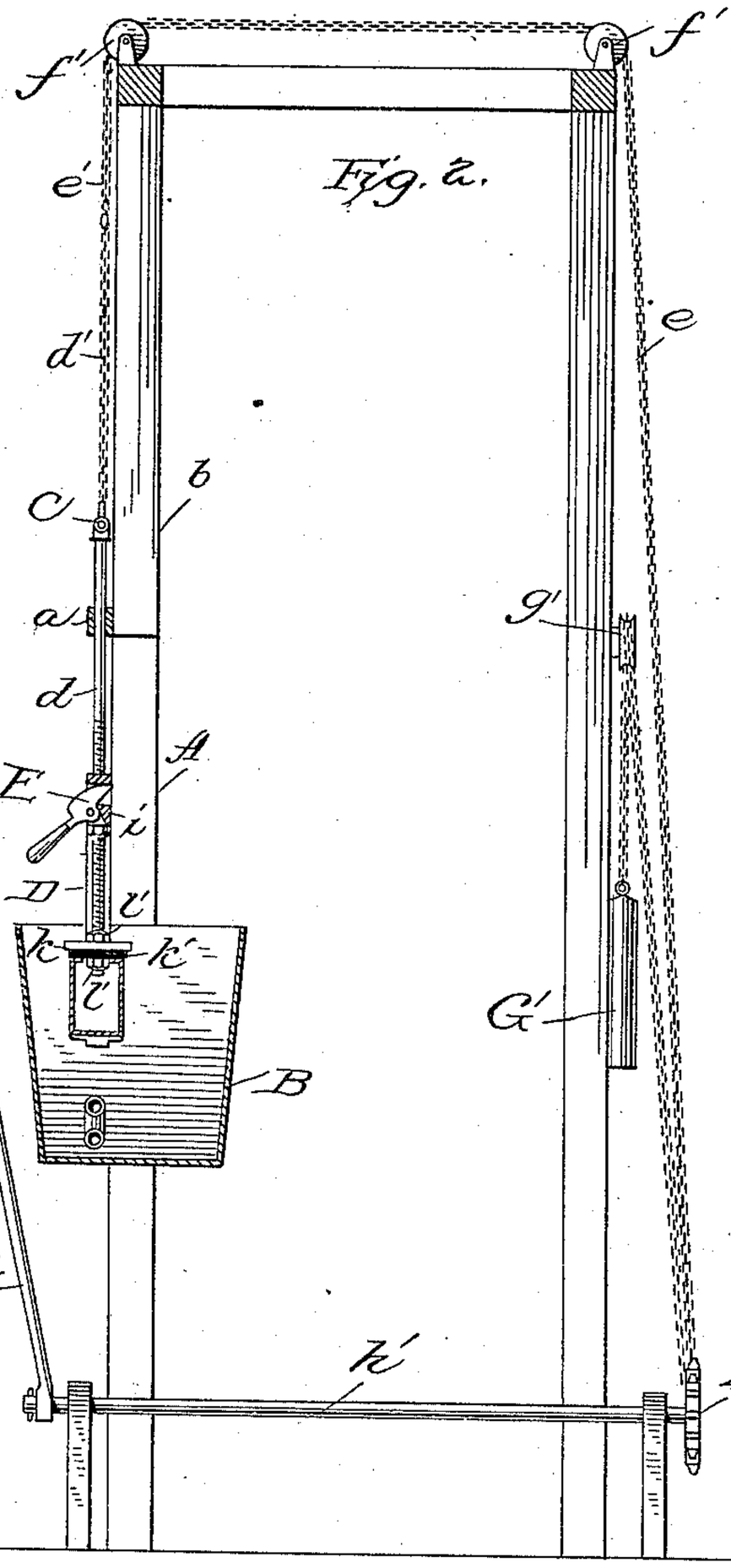
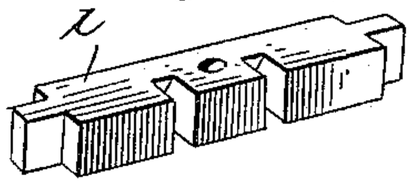


Fig. 5.



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UNITED STATES PATENT OFFICE.

JOSEPH E. REYNOLDS AND WINFIELD S. REYNOLDS, OF PORT DEPOSIT, MARYLAND.

CAN-TESTING MACHINE.

SPECIFICATION forming part of Letters Patent No. 330,924, dated November 24, 1885.

Application filed July 14, 1885. Serial No. 171,618. (No model.)

To all whom it may concern:

Be it known that we, JOSEPH E. REYNOLDS and WINFIELD S. REYNOLDS, of Port Deposit, in the county of Cecil and State of Maryland, have invented a new and useful Improvement in Can-Testing Machines; and we do hereby declare that the following is a full, clear, and exact description of the same.

Our invention relates to an apparatus for testing cans in which food products are packed, and is designed particularly as an improvement upon that class of testing-machines which subject the cans to air-pressure while immersed in water.

The objects of the invention are to produce a machine capable of testing a great many cans at the same time, to produce a machine of simple and cheap construction, and, further, to produce a machine capable of being operated by unskilled labor without lessening the quality of the work performed.

The invention consists of a vertically-movable frame carrying a series of can-holders with clamps for the cans within the same, together with a suitable water-tank for immersing the cans, and suitable appliances for applying an air-pressure to the inside of the cans.

The invention further consists in details of construction hereinafter fully described, and specifically pointed out in the claims.

In the accompanying drawings, Figure 1 is a front elevation of our improved apparatus, showing also the air-receiver with the air-pump attached. Fig. 2 is an end elevation showing the arrangement by which the frame is raised and lowered. Fig. 3 is an enlarged detail view of the can-holding frame and the cam for raising the same. Figs. 4, 5, and 6 represent details of construction hereinafter particularly referred to.

In these drawings, A A represent vertical standards extending from floor to ceiling and supporting at a suitable height from the floor a water-tank, B, this tank being of a length equal to the space between the standards and of any suitable width, the size not being material. Extending across between the standards, above the water-tank, is a pipe, C, having short sections *c c* at the ends running at right angles to the pipe C, and parallel with and against the standards. These short sections are fitted to grooves or ways in the standards, and serve to guide the pipe C and its connection in its vertical movement, as hereinafter described. A cross-beam, *a*, connects the two vertical standards together, as shown in Fig. 1, and a short standard, *b*, is supported from the cross-piece, extending upward to the ceiling. At suitable intervals along the pipe C sections *d d* of pipe are coupled, extending downward a certain distance, where each is connected to a can-carrying frame, D. This frame consists of two side bars, *e e*, a bottom, *f*, serving as a seat for the can, and a cross-bar or plate, *g*, across the top. The side bars are slotted at top and bottom, as shown at *h h*, with elongated slots, the upper of which are adapted to receive the reduced ends of a bar, *i*, clamped to the pipe *d*. The ends of the bar *i* are of smaller size than the slots, and have a certain amount of vertical play therein. Near the lower end of the pipe *d* is secured a circular plate, (preferably,) *k*, having tangs or projections adapted to the slots in the lower parts of the side pieces, these tangs having similar free movement vertically to a certain extent. Between the under side of this plate, which serves as a stiffening-plate, and the end of the pipe is clamped a rubber cushion, *k'*, adapted to fit over and close the opening in the top of the can C' to be tested, as hereinafter fully described. The rods *d* are threaded, and the plates *k* and the rubber cushions *k'* are held in place by nuts *l' l'* above and below, and by moving these nuts up or down the distance may be increased or diminished between the seats for cans of different heights. When the can-holding frames are in their normal position, the distance between the bottom seat and the rubber cushion or upper seat is greater than the height of the can, and after the can C' is placed upon the bottom seat it is necessary to provide means for bringing the two seats together to clamp the can between them. To do this we have provided the tool shown in detail at E. It has two prongs a suitable distance apart, and both alike. These prongs are adapted to straddle the pipe *d* and to be pivoted at 1 in a recess upon each side of the pipe *d* in the bar *i*. As shown in

the detail figure, the tool has a lower part, 2, and is pivoted at its center in the recess in the cross-bar *i*, this recess being inclined at its rear, so as to allow a certain amount of movement of the tool. The upper part, 3, is about twice the width of the part 2, and extends across the whole width of the said bar, having a curved upper face. The construction of the parts is the same upon each side of the pipe *d*, and as the curved faces of the tool-prongs bear against the upper cross-bar a downward movement of the handle will force the cross-bar, and consequently the side bars and the bottom seat, upward, thus pressing the top of the can firmly against the upper seat or cushion on the end of the pipe *d*. The slots in the side bars permit of this movement without moving the other parts. When the cans have been thus clamped between the seats, the frame is ready to be lowered into the water-tank. In order to do this the following construction has been provided: Ropes or chains *d' d'* extend from each end of the pipe C, and from the center to a large ring, D', near the ceiling, and from this ring a single rope or chain, *e'*, extends over suitable pulleys, *f' f'*, mounted on the frame, thence downward over a sprocket-wheel, 4, thence upward again over a second pulley, *g'*, and then extends downward again, terminating in a balance-weight, G'. The sprocket-wheel 4 has a suitable shaft, *h'*, extending to the front, with a handle, h^2, attached thereto, and by moving the handle in one direction or the other the frame with the can-holders is raised or lowered out of or into the water. As the cans are immersed in water, the air-pressure is applied to the inside in the following manner: The pipes *d d* are all connected with the pipe C, and there is a free interior passage between the same. The pipes *d* are open at their ends and penetrate the rubber cushions opening to the interior of the can. From an air-pump the air is forced into a receiver, G, suspended from the ceiling by brackets, and from this receiver a pipe, 5, extends to the cross-beam *a*, and along that beam to about the center of the apparatus, terminating in an elbow extending up vertically. This pipe 5 is provided near its end with a pressure-gage, a^2, and a stop-cock, so as to shut of the air-pressure when necessary. From the end of pipe 5 a flexible pipe, 6, extends to the standard, where it is connected with the pipe *c*, thus supplying air to all the pipes. The pipe 6 being flexible and of sufficient length allows the frame to be raised and lowered without interrupting the operation of the apparatus. It will be understood, therefore, that after the cans have been properly clamped and lowered within the tank the stop-cock is turned and the air-pressure applied to the cans through the pipes 5, 6, *c*, C, and *d*, thus placing the cans under a pressure of air from within and a water-test from without. The water in the tank is heated in any desirable manner by a coil of pipe running around inside and connected to the exhaust of the engine or in any suitable manner. This heating of the water is very desirable, as it increases the pressure of the air within the cans as soon as they are immersed in the water, and this heating tends to make the cans dry quickly when exposed to the air.

It will be understood that the air pump and receiver are of ordinary construction.

The parts of the apparatus as described may be materially changed in many ways without altering our invention or departing from the spirit thereof. As the cans are tested, the operator directs them upon an endless belt arranged at the rear of the machine, which carries them off to a receptacle provided for them.

Instead of the frame being raised and lowered the tank of water might be raised and lowered by hydraulic power.

To facilitate the operation of the machine, and to render the placing and removing of the cans from the frames more expeditious and less laborious, we may raise and lower the can-frames simultaneously and at one operation. This we accomplish, as shown in Fig. 1, by connecting the several levers by a rod or bar extending the entire length of the machine, and operating the said bar to work the levers by a hand-lever at one end pivoted to the frame-work similar to that shown. This bar is shown in dotted lines at *a'*, and in order that it may be operated uniformly throughout its whole length by means of a single handle, we connect it to a second bar, a^3, also shown in dotted lines by bell-crank levers a^4 and links a^5, the handle *b'* being connected to one of the bell-crank levers.

Having thus described our invention what we claim is—

1. A can-testing apparatus comprising a vertically-moving frame, can-holders suspended therefrom, a water-tank beneath the same, an air-receiver, and suitable connections with said air-receiver, substantially as described.

2. A can-testing apparatus comprising a vertically-moving frame, can-holders suspended therefrom, a water-tank beneath the same, an air-receiver, and pipe therefrom, and a flexible pipe connecting the movable frame with the said air-receiver, substantially as described.

3. A can-testing apparatus comprising a vertically-moving frame, can-holders suspended therefrom having a fixed upper seat and a movable lower seat, clamping devices for clamping the seats together upon the can, a water-tank, an air-receiver, and suitable connections therewith, substantially as described.

4. In a can-testing machine, the combination, with the movable frame, of the can-holders, consisting of the side bars, slotted as described, the top connecting-bar, the lower can-seat and the upper seat, the cross-bar *i*, and the tool pivoted thereto and adapted to move the seats together to clamp the can, when operated, substantially as described.

5. A can-testing machine comprising the vertically-movable frame carrying the can-holders, flexible connection with the air-supply, the water-tank, and means, substantially as described, for elevating the frame or lowering the same, substantially as described.

6. In a can-testing machine, the combination, with a can-holder, vertically-movable, of an air-receiver, pipe-connections thereto, and an endless belt for removing the cans as they are discharged, substantially as described.

7. A can-testing machine comprising suitable standards, a frame vertically movable between the same, can-holders suspended from said frame having means for clamping the can-seats upon the can, a water-tank, means for raising and lowering said frame, and flexible connection between said frame and an air-receiver, substantially as described.

8. In a can-testing machine, and in combination, the vertically-movable can-holding frames, the can-seats, the levers or tools for moving the holding-frames, an operating lever or device, and suitable connections between the said device and each of the levers or tools whereby the can-frames may be moved simultaneously, substantially as described.

In testimony whereof we have signed our names to this specification in the presence of two subscribing witnesses.

JOSEPH E. REYNOLDS.
WINFIELD S. REYNOLDS.

Witnesses:
J. L. BALLAM,
F. M. ALEXANDER.