No. 876,558. PATENTED JAN. 14, 1908.

O. J. JOHNSON.

CAN TESTING MACHINE.

APPLICATION FILED APR. 3, 1907.

2 SHEETS—SHEET 1.

Fig. 1.

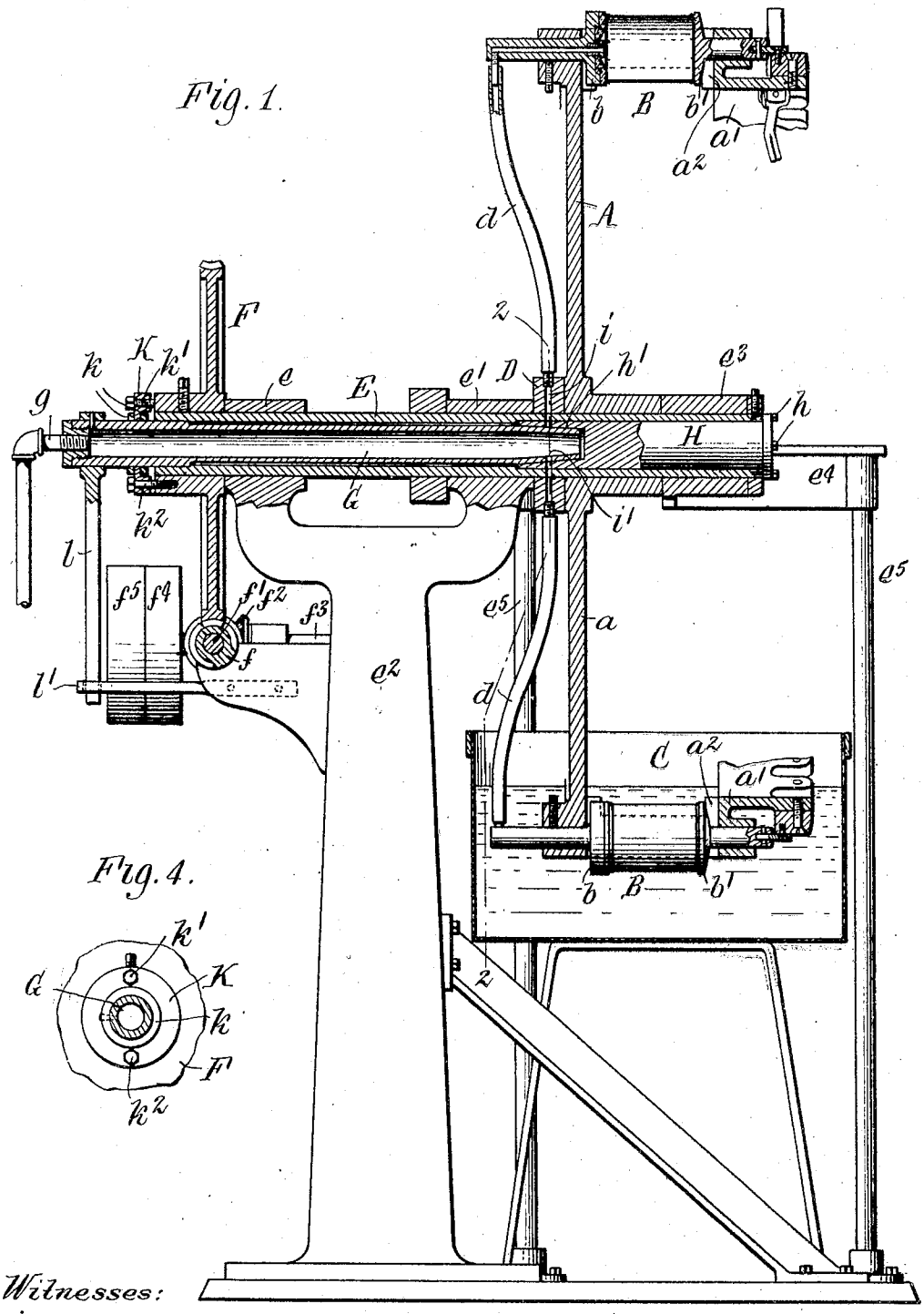

Fig. 4.

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2 SHEETS—SHEET 2.

Fig. 2

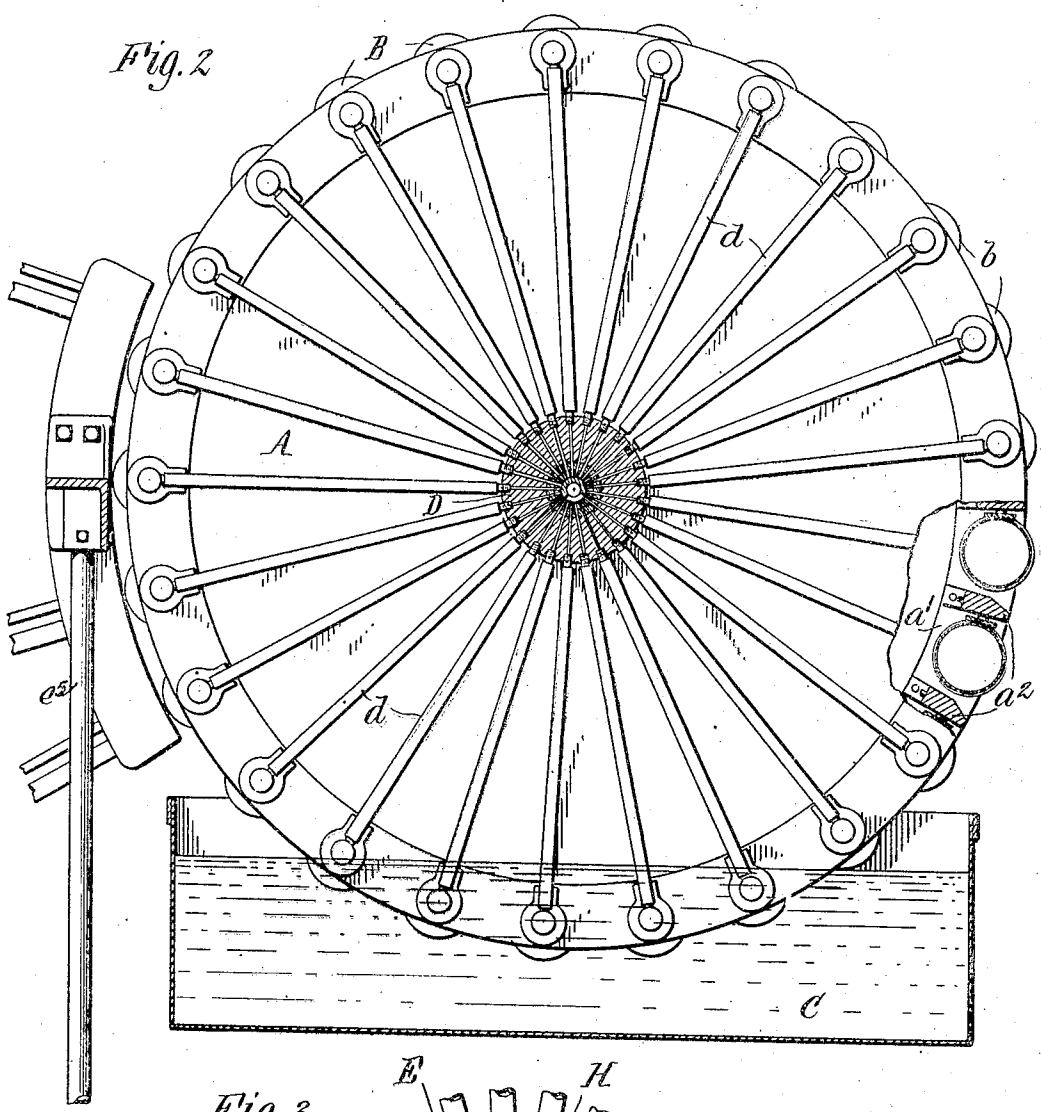
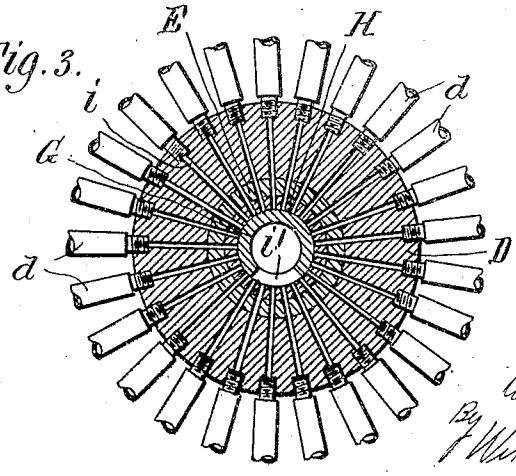


Fig. 3.



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UNITED STATES PATENT OFFICE.

OLIVER J. JOHNSON, OF WHEELING, WEST VIRGINIA.

CAN-TESTING MACHINE.

No. 876,558. Specification of Letters Patent. Patented Jan. 14, 1908.

Application filed April 3, 1907. Serial No. 366,134.

To all whom it may concern:

Be it known that I, OLIVER J. JOHNSON, a citizen of the United States, residing at Wheeling, in the county of Ohio and State of West Virginia, have invented a new and useful Improvement in Can-Testing Machines, of which the following is a specification.

This invention relates more particularly to can testing machines of that type in which the cans are held tightly closed in holders on a carrier or wheel and are successively immersed in water, the cans being filled with air under pressure, and the leaky cans being detected by bubbles formed in the water by the air escaping from them. Air under pressure is delivered to the several can holders by branch pipes or passages on the revolving carrier, and air-controlling or distributing means are provided for establishing an interrupting communication between these branch passages and a main air supply pipe or conduit. The invention is also applicable to other can testing or analogous machines requiring an air-controlling device or valve for establishing an interrupting communication between a stationary conduit and moving air passage.

The invention is directed to improvements in the air-controlling or distributing means, and its primary object is to so construct and arrange the same with respect to the can carrier or wheel and its supporting and driving means that the air distributing device or valve is accessible and can be readily adjusted or taken apart for examining, cleaning or repairing the same, without dismantling or disturbing any of the other parts of the machine.

Another object of the invention is to so construct the air distributing device or valve that it occupies but little space between the carrier or wheel and the bearing for the latter, thus enabling the wheel to be located close to the bearing where it will have a more stable support.

In the accompanying drawings, consisting of two sheets: Figure 1 is a central sectional elevation of a can testing machine embodying the invention. Fig. 2 is a fragmentary transverse sectional elevation thereof, in line 2—2, Fig. 1. Fig. 3 is an enlarged section of the air distributing device, in line 2—2, Fig. 1. Fig. 4 is a cross-section in line 4—4, Fig. 1.

Like letters of reference refer to like parts in the several figures.

A represents the rotary carrier or wheel, B the can clamps or holders arranged around the peripheral portion of the carrier, and C the testing tank which holds the water into which the holders and cans carried thereby are successively immersed in the rotation of the carrier. The invention does not relate to these parts and they may be of any usual or suitable construction. In the machine shown in the drawings, the carrier consists of a circular disk or plate a and a ring a' spaced therefrom and supported by brackets a^2, and the can clamps consist of opposite heads b b' between which the cans are grasped and which are located between the carrier disk and ring and carried by stems passing through holes in the carrier disk and ring. The clamp heads b' are moved toward and from the opposite stationary heads b to clamp and release the cans, by mechanism not shown. The stems of the stationary clamp heads b have longitudinal passages therein for admitting the air to the cans while held by the clamps, and the several stems are connected by branch air pipes or passages d to a hub or ring D at the center of the carrier and which turns therewith. This ring may be formed integrally with the carrier but it is preferably separate from but secured to turn with the carrier.

The carrier or wheel A is secured to a hollow shaft E which, in the machine illustrated, passes through and is journaled in two bearings e e' on a frame or column e^2, and a third bearing e^3 on a bracket e^4 supported at one side of the carrier by standards e^5. The carrier and the ring D with the branch air passages are fixed on the shaft between the bearings e' and e^3. For driving the carrier a worm wheel F is fixed to one end of the hollow shaft and meshes with a worm f on a counter-shaft f' connected by bevel gearing f^2, with a drive shaft f^3 provided with fast and loose pulleys f^4 f^5 for a drive belt. The carrier shaft could be mounted and driven by any other suitable means, as these means form no part of the invention.

The air-controlling or distributing means are constructed as follows: G represents a stationary main air tube or conduit which extends into the hollow shaft through one end thereof, the tube being of a diameter to allow the shaft E to rotate freely about the same. The outer end of this tube is connected in any suitable manner to a supply

pipe g for air under pressure. H represents a bushing or plug which extends into the hollow carrier shaft through the opposite end thereof, said bushing or plug fitting tightly in the shaft and being secured to turn with the shaft, for instance, by screws h, Fig. 1, passing through a flange at the outer end of the bushing into threaded holes in the end of the carrier shaft. The inner ends of the air tube G and bushing H are formed to bear one against the other, the one constituting in effect a valve, and the other a seat for the valve. Preferably the bushing has a conical cavity h' constituting the valve seat, and the air tube has a corresponding conical end fitting in said cavity and constituting the valve. The bushing H and air distributing ring or hub D turn with the carrier shaft, and registering holes i through these three parts connect the branch air pipes or passages d leading from the several can holders to the valve seat in the bushing H. The stationary air tube has a port i' with which said holes i are adapted to register successively in the rotation of the carrier. As long as the hole is in registration with the valve port i' the compressed air will pass through it and the communicating branch air pipe into the can in the holder to which said pipe leads, and the port is preferably so arranged and proportioned that each hole i and connecting branch pipe will remain in communication therewith and supply air under pressure to the can, at least so long as the can is submerged in the water. The stationary air tube is adjustably and removably secured in the carrier shaft by suitable means which, in the construction shown (see Figs. 1 and 4), consist of a ring K surrounding the projecting end of the air tube between fixed collars k theron and secured to the hub of the worm wheel by adjusting screws k' k^2. The screw k' works in a threaded hole in the ring and bears against the hub of the worm wheel, while the other screw k^2 passes through a smooth hole in the ring and screws into a threaded hole in the hub of the worm wheel. By unscrewing one screw and screwing up the other, the ring with the tube can be adjusted in or out to cause its conical end to properly seat in the cavity of the bushing. The air tube is held from turning by an arm l secured thereto and engaging a bracket or part l' on the frame of the machine. The air tube G can be readily released and withdrawn endwise from the carrier shaft by first detaching the adjusting ring and disconnecting the tube from the air supply pipe and the arm l from the holding bracket l'. Any other convenient means could be employed for holding and adjusting the air tube.

The bushing H can also be released and withdrawn from the other end of the carrier shaft by first unscrewing the screws h which fasten it to the shaft. Thus either the air tube or the bushing, or both, can be easily and quickly detached and removed without disturbing the carrier or its supporting and driving means. The described construction permits the air-distributing device or valve to be readily adjusted or removed to examine, clean or repair it, and the parts of the air-distributing device, with the exception of the ring or hub D, are located within the carrier shaft, and the distributing ring being thin, the carrier can be secured on the shaft close to its bearing where it will be rigidly supported.

The operation of these testing machines is well understood. The cans are fed to the holders B at the descending side of the carrier before they enter the water, and are held tightly closed by the holders. Air under pressure enters each can when the branch air pipe d for its holder registers with the port i' in the air tube G, which occurs before or while the can is submerged. If the can leaks, the air escaping therefrom will form bubbles in the water and an attendant operates the holder for this can to discharge it at a different point in the revolution of the carrier from that at which the perfect cans are discharged, the leaky and perfect cans being thus separated.

The essential idea of the invention is the construction and arrangement of the air-distributing device or valve so that it is accessible and can be adjusted or removed, if necessary for any reason, without disturbing the carrier or other parts of the machine, and it is not dependent upon the construction of such other parts of the machine. Furthermore, the invention is not restricted to the particular construction of the air-distributing device or valve shown in the drawings, as the details of the construction could be changed without departing from the principle of the invention.

I claim as my invention:

1. In a can testing machine, the combination of a moving carrier provided with a can holder, a main air pipe, and means for establishing and interrupting communication between said main air pipe and said can holder comprising relatively stationary and movable parts, one of which parts is separable from said carrier and is constructed and arranged so that it is removable from the machine independently of said carrier or its parts, substantially as set forth.

2. In a can testing machine, the combination of a rotary carrier provided with can holders, a main air pipe, branch air passages movable with said carrier and leading to said can holders, and means for establishing and interrupting communication between said main air pipe and said branch passages comprising a valve and valve seat, one of which rotates with said carrier and one of which is separable from said carrier and is constructed

and arranged so that it is removable from the machine independently of said carrier or its parts, substantially as set forth.

3. In a can testing machine, the combination of a rotary carrier provided with can holders, and air passages leading to said can holders, a stationary air conduit arranged axially with respect to said carrier, a rotary part coöperating with said conduit to establish and interrupt communication between the same and said air passages, said stationary conduit being separable from said carrier and constructed and arranged so that it is removable from the machine independently of said carrier or its parts, substantially as set forth.

4. In a can testing machine, the combination of a rotary carrier provided with can holders, and passages leading to said holders, means for rotatably supporting said carrier, a main pipe, and means for controlling communication between said main pipe and said passages comprising parts, one of which rotates with said carrier, one of said parts being separable from said carrier supporting means and removable from the machine independently of said supporting means and said carrier whereby it can be removed without disturbing the carrier, substantially as set forth.

5. The combination of a rotatable carrier provided with can holders, and passages leading to said holders, a hollow supporting shaft for said carrier, a main pipe, and means located within said hollow shaft and controlling communication between said main pipe and carrier passages, said means being removable from said hollow shaft independently of said carrier, substantially as set forth.

6. The combination of a rotatable carrier provided with can holders, and passages leading to said holders, a hollow supporting shaft for said carrier, a main pipe, and means controlling communication between said main pipe and carrier passages comprising a part which turns with said carrier, and an air conduit which extends into said hollow shaft and is removable therefrom independently of said carrier, substantially as set forth.

7. The combination of a rotatable carrier provided with can holders, and passages leading to said holders, a hollow supporting shaft for said carrier, a main pipe, and means controlling communication between said main pipe and carrier passages comprising a part which turns with said carrier, an air conduit which extends into said hollow shaft and is removable therefrom independently of said carrier, and means for adjusting said conduit in said shaft, substantially as set forth.

8. The combination of a rotatable carrier or wheel provided with passages, a hollow supporting shaft for said carrier, a main pipe or passage, and means for controlling communication between said main pipe or passage and said carrier passages comprising a valve removably secured in said hollow shaft, and a bushing also removably secured in said shaft for coöperation with said valve, substantially as set forth.

9. The combination of a rotatable carrier or wheel provided with passages, a conduit removably secured axially in said carrier and having a port, and a bushing removably secured axially in said carrier and having holes connecting with said carrier passages and arranged to register with said conduit port, substantially as set forth.

10. The combination of a rotatable carrier or wheel provided with passages, a conduit arranged axially in said carrier and having a port, and a bushing arranged axially in said carrier and having holes connecting with said carrier passages and arranged to register with said conduit port, said conduit and bushing being removable from said carrier at opposite sides thereof independently of the carrier, substantially as set forth.

Witness my hand this 23d day of March, 1907.

OLIVER J. JOHNSON.

Witnesses:
J. LATNA MCLAIN,
C. E. CLOVIS.