(No Model.) 3 Sheets—Sheet 1.

D. D. RANNEY.

CAN TESTING MACHINE.

No. 528,987. Patented Nov. 13, 1894.

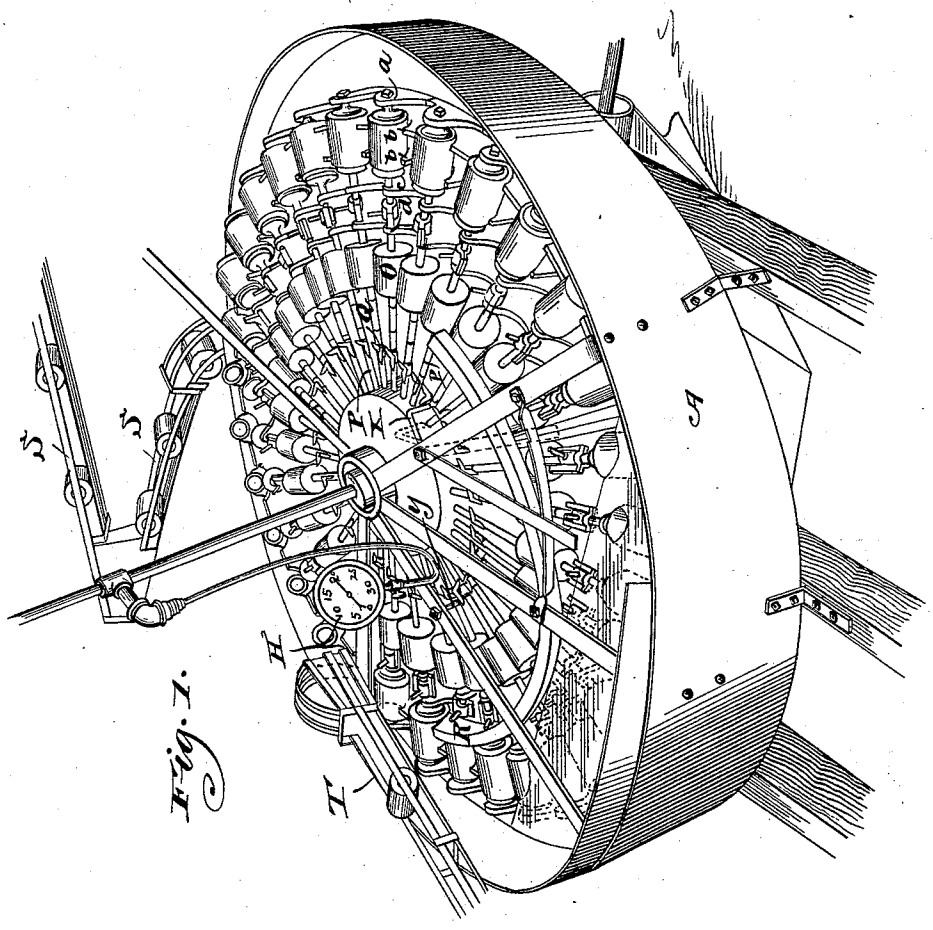

Fig. 1.

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F. B. Goodwin.

Inventor,
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By Offield, Towle & Linthicum
Attys.

(No Model.) 3 Sheets—Sheet 2.

D. D. RANNEY.

CAN TESTING MACHINE.

No. 528,987. Patented Nov. 13, 1894.

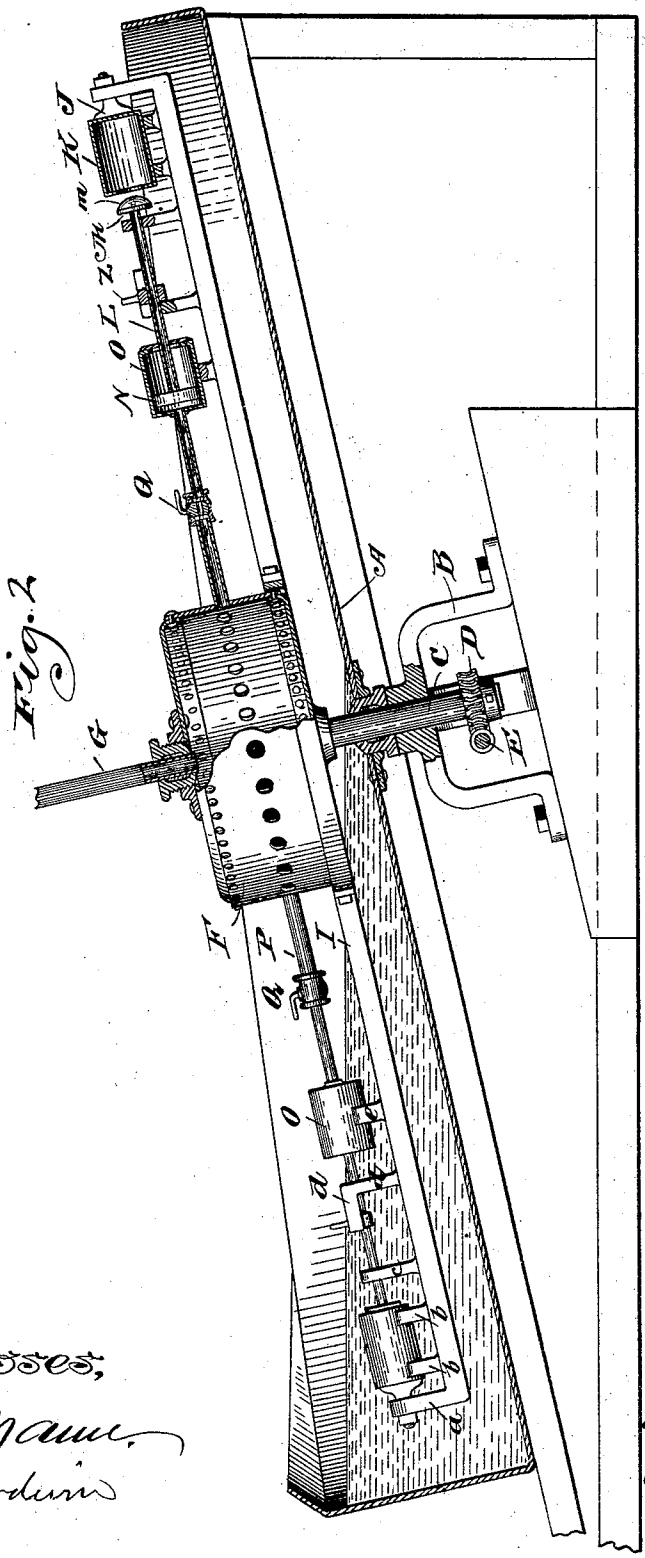

Fig. 2.

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(No Model.) 3 Sheets—Sheet 3.

D. D. RANNEY.

CAN TESTING MACHINE.

No. 528,987. Patented Nov. 13, 1894.

Fig. 3.

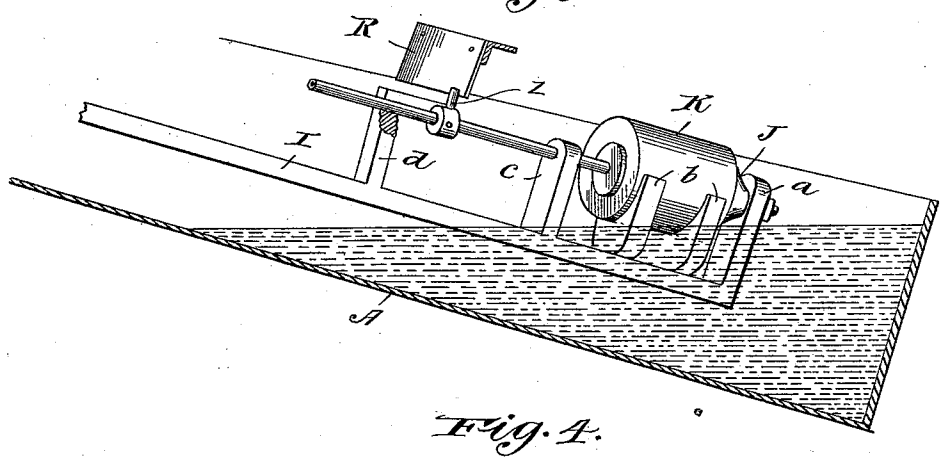
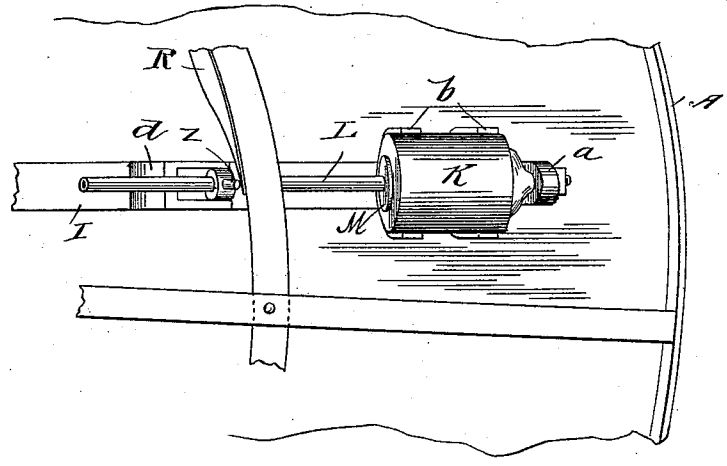


Fig. 4.



Witnesses,
Alex. Scott
Albin M. Long.

Inventor,
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UNITED STATES PATENT OFFICE.

DARWIN D RANNEY, OF LEWISTOWN, ILLINOIS, ASSIGNOR, BY MESNE ASSIGNMENTS, TO MOSES TURNER, TRUSTEE, OF SAME PLACE.

CAN-TESTING MACHINE.

SPECIFICATION forming part of Letters Patent No. 528,987, dated November 13, 1894.

Application filed May 16, 1893. Serial No. 474,451. (No model.)

To all whom it may concern:

Be it known that I, DARWIN D. RANNEY, of Lewistown, Illinois, have invented certain new and useful Improvements in Can-Testing Machines, of which the following is a specification.

This invention relates to machines for testing sheet metal cans for the detection of imperfections in manufacture which would prevent them from being made air tight.

To this end the invention has for its principal object to provide a machine which shall be automatically operative to test the cans; and to this end the machine comprises in the preferred construction a stationary tank for holding a testing liquid; a rotary can carrier for submerging the cans in the liquid; a reservoir for compressed air; stationary chucks or rests for engaging the closed end of the cans; movable clamp-gaskets for closing the apertures of the open ends of the cans; air cylinders having working pistons connected with the movable clamps; passages for the compressed air which passages are formed in part by the piston rods which are hollow for this purpose; and suitable valves for controlling the air supply passages with means for operating the valves and for moving the clamps back to release the cans.

In the accompanying drawings, Figure 1 is a perspective view, and Fig. 2 a central vertical sectional elevation. Fig. 3 is a detail sectional view through a portion of the tank, a portion of the frame and its bearings with the can supports and a part of the tripping mechanism in broken elevation. Fig. 4 is a detail in plan of the same parts shown in Fig. 3.

In the drawings, A represents a tank for containing a test fluid, preferably hot water. Said tank as shown is mounted in an inclined position on the supporting frame B so that the testing liquid is confined to one side of the tank.

C is a central shaft which passes up through the bottom of the tank and is driven by the worm gearing D, E. Within the tank and upon the shaft C is mounted drum F which forms a reservoir for compressed air which is forced into the same through pipe G.

H is a pressure gage connected with pipe G.

I represents a frame which may be composed of a series of radial arms, a cast skeleton frame or of other form, and is provided with brackets *a, b, c, d, e*, which are arranged in a series of circles raidially with reference to the drum F. The brackets *a* each carry a stationary chuck J which consists of a disk adapted to engage the closed ends of the cans K for which the brackets *b* furnish saddles or supports. The brackets *c, d* are perforated and form guides for the hollow piston rods L and the latter carry at their outer ends the clamps M provided with rubber or leather gaskets *m* which are adapted when the piston rods are moved out to close the apertures in the cans. The gaskets have perforations to permit air to enter the cans.

N represents the pistons which work within the cylinders O mounted on brackets *e* and having their outer ends open.

P represents pipes which form passages between cylinders O and drum F, said pipes being threaded at each end and engaged in threaded apertures in the side wall of the drum and the cylinder head.

Q represents three way valves which are turned by a suitable trip *x* into proper position to open the passage from the drum to the cylinders, thus allowing the compressed air to enter the cylinders. A second trip *y* turns the valves into such position as to close the passage from the drum and open the cylinders to the atmosphere. The piston rods carry studs *z* which are engaged by the track rail R at the proper point to move the piston rods back thus unclamping the can and returning the pistons into normal position.

The cans may be placed and removed by hand or they may be fed by the chute S and removed by the chute T.

The operation is as follows: The cans are placed upon their saddles or supports and the carrier being in motion as the valves reach the trip *x* they are turned so as to permit air under pressure to enter the cylinder behind the piston. The large area of the latter as compared with the small area of the passage through the hollow piston rod affords sufficient differential pressure to drive the piston out thus closing the opening of the can. The air rushing through the hollow

of the piston rod enters the can and the latter is simultaneously or subsequently submerged in the test liquid. The pressure may be carried up to twenty pounds if desired. The hot water will cause expansion of the air and this added to the initial pressure will cause the air to find any opening or weak joint in the can. The escaping air will rise through the water showing bubbles for even the slightest escape. An attendant watches the operation and removes any defective cans.

While I have described my machine as adapted to the employment of an inclined tank, I do not intend thereby that it can only be so used.

The invention hereinafter claimed can be employed with other means for submerging the cans in the test liquid. Neither is it essential to force air into the cans as my means for operating the clamps can be utilized where the expansion of the air within the sealed can by the act of submerging it in the bath is relied upon alone to test the can.

I claim—

1. In a can testing machine, the combination with a can carrier having chucks for the can, of a reservoir to contain air under pressure, a series of cylinders in communication with the reservoir, valves controlling the passage of air to the cylinders, pistons working in the cylinders and having piston rods, and clamp-gaskets carried by the piston rods, substantially as described.

2. In a can testing machine, the combination with a can carrier having can supports radially arranged thereon, a central air reservoir or drum mounted on and moving with the carrier, a series of cylinders radially arranged about the drum and communicating therewith by suitable pipes, valves in said pipes and adapted to control the passage of air from the drum to the cylinders and permit the exhaust of the air from the cylinders to the atmosphere, pistons within the cylinders, and hollow piston rods carrying clamp gaskets adapted to close the open ends of the cans, and means for operating the valves automatically, substantially as described.

3. In a can testing machine the combination with a can carrier having can supports radially arranged thereon, a central air reservoir or drum mounted on and moving with the carrier, a series of cylinders radially arranged about the drum and communicating therewith by suitable pipes, valves in said pipes and adapted to control the passage of air from the drum to the cylinders and permit the exhaust of the air from the cylinders to the atmosphere, pistons within the cylinders, and hollow piston rods carrying clamp gaskets adapted to close the open ends of the cans, and means for operating the valves automatically, and a tank to contain a test liquid into which the cans are dipped while closed, substantially as described.

4. In a can testing machine, the combination with a rotary can carrier, a central reservoir or drum to contain compressed air, a series of cylinders arranged radially about the drum, pipes forming passages between the drum and the cylinders, and valves in said pipes, pistons working within the cylinders and having hollow piston rods, clamp gaskets carried by said rods and having apertures for the admission of air to the cans and suitable tripping mechanisms whereby the valves are first turned to permit the air to enter the cylinders and pass thence to the can and then turned to permit the air to exhaust from the cylinders, and whereby the clamp gaskets are released to release the cans, substantially as described.

DARWIN D. RANNEY.

Witnesses:
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