No. 893,101. PATENTED JULY 14, 1908.

F. RUDOLPHI & C. J. NELSON.

CAN TESTING MACHINE.

APPLICATION FILED MAY 13, 1904.

3 SHEETS—SHEET 1.

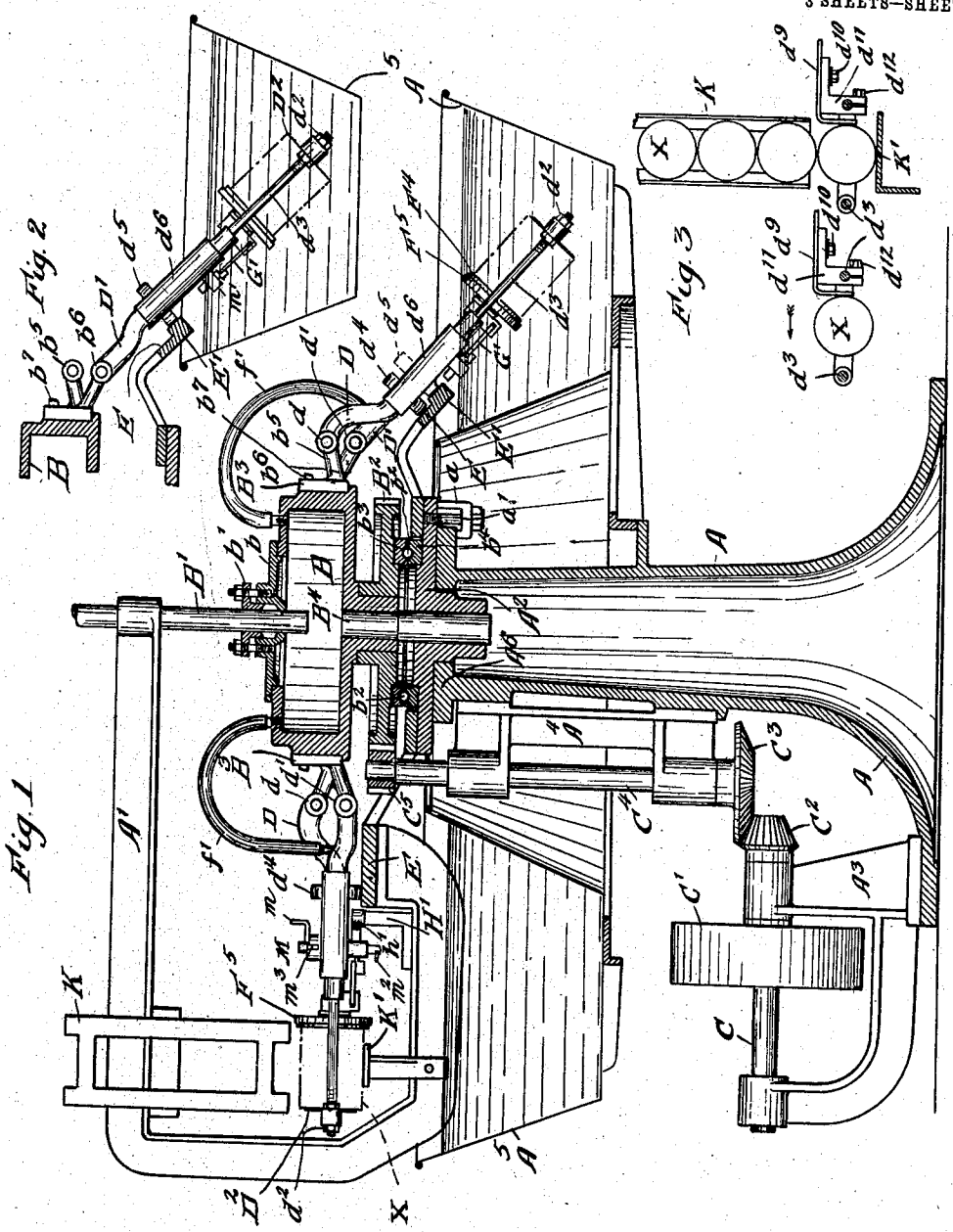


Fig. 1

Fig. 2

Fig. 3

Witnesses:

Wm. Geiger

H. W. Munday.

Inventors:

Frank Rudolphi

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3 SHEETS—SHEET 2.

Fig. 4

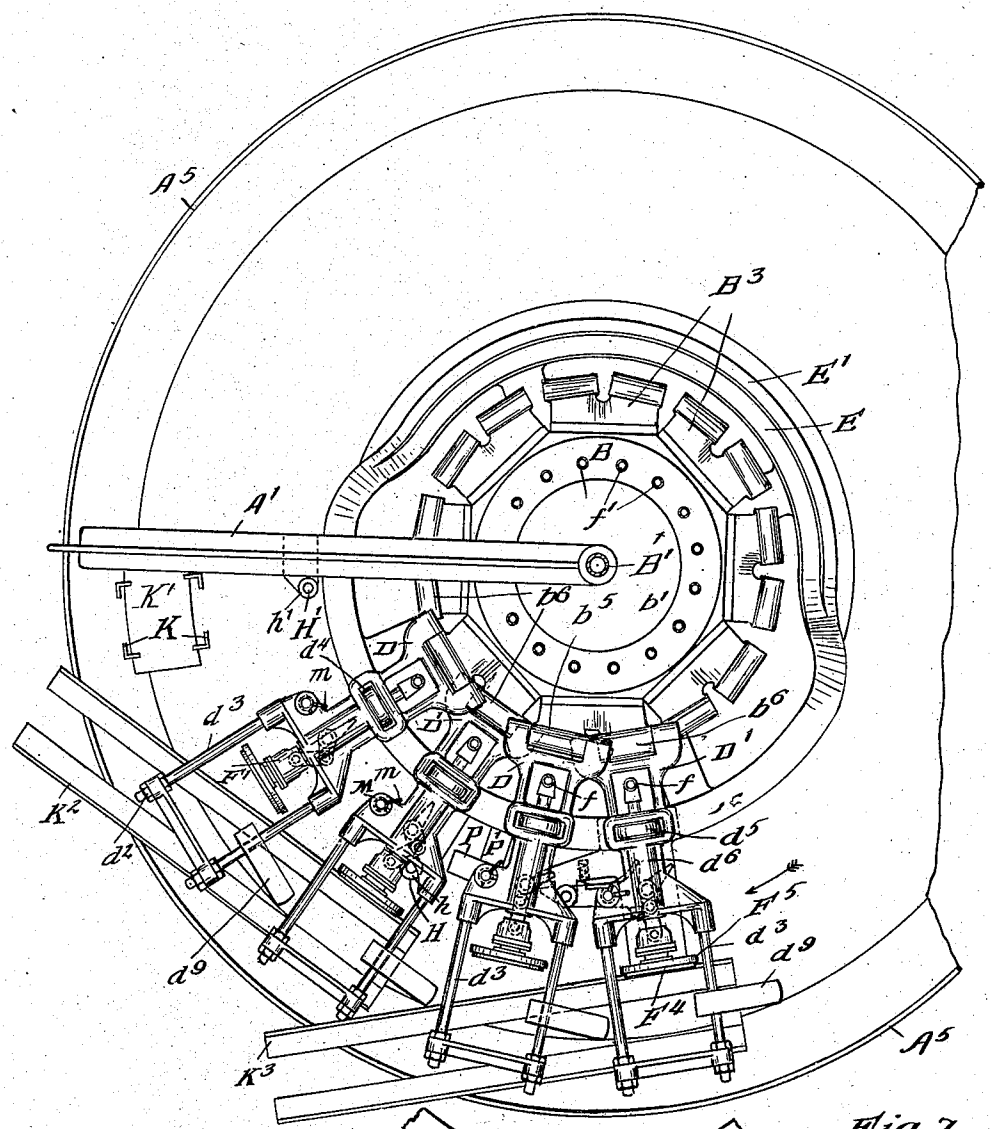


Fig. 5

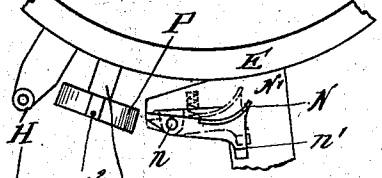


Fig. 7

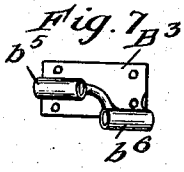
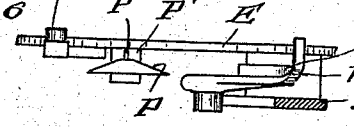


Fig. 6



Witnesses:

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3 SHEETS—SHEET 3.

Fig. 8

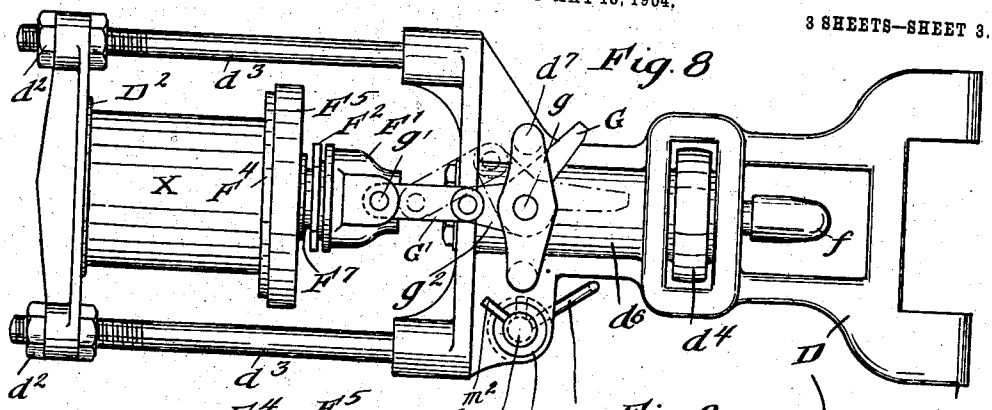


Fig. 9

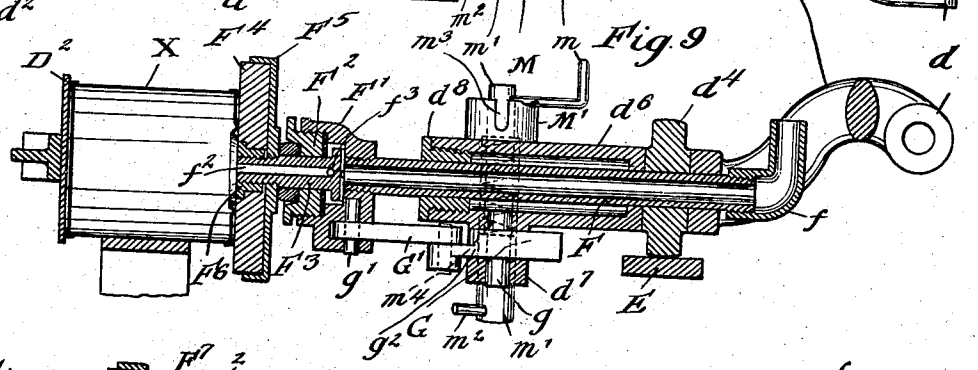


Fig. 10

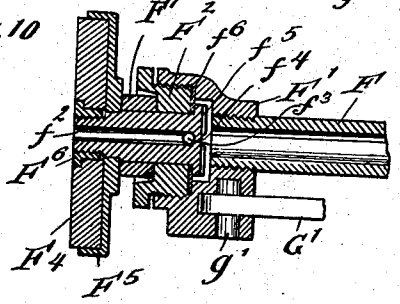


Fig. 11

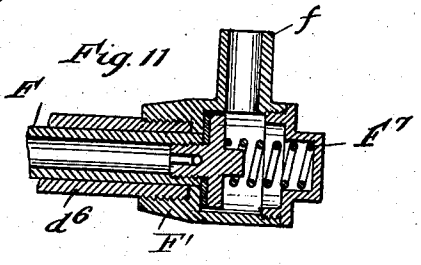
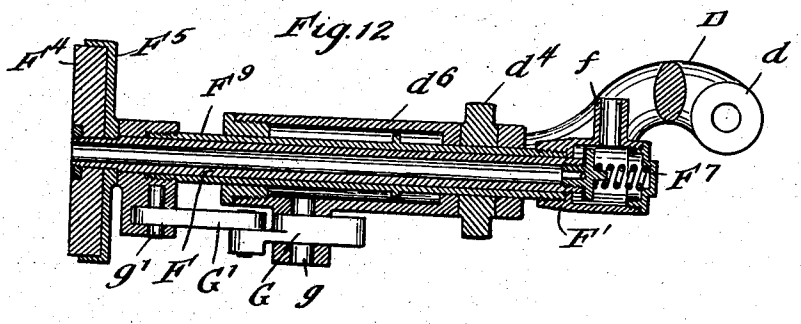


Fig. 12



Witnesses:

Wm. Guger.

A. W. Munday

Inventors:

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UNITED STATES PATENT OFFICE.

FRANK RUDOLPHI, OF CHICAGO, AND CHARLES J. NELSON, OF MAYWOOD, ILLINOIS, ASSIGNORS TO AMERICAN CAN COMPANY, OF NEW YORK, N. Y., A CORPORATION OF NEW JERSEY.

CAN-TESTING MACHINE.

No. 893,101. Specification of Letters Patent. Patented July 14, 1908.

Application filed May 13, 1904. Serial No. 207,786.

To all whom it may concern:

Be it known that we, FRANK RUDOLPHI, a citizen of the United States, residing in Chicago, and CHARLES J. NELSON, a citizen of the United States, residing in Maywood, both in the county of Cook and State of Illinois, have invented a new and useful Improvement in Can-Testing Machines, of which the following is a specification.

Our invention relates to can testing machines.

The object of our invention is to provide a machine of a simple, efficient and durable construction, by means of which cans may be automatically, perfectly and rapidly tested and the defective cans separated from the perfect ones, and which will operate to close the cans, fill them with compressed air and carry them submerged in water, or other liquid, for the requisite length of time to permit the ready detection of a leaky or defective can by escaping air bubbles in the water, and which will, at the same time, occupy a small amount of space in the can factory and thus not interfere with the placing of the lines of other can making machines, with one line of which each tester is connected, or from which it receives the cans, in series of parallel lines in close juxta-position to each other.

Our invention consists in the means we employ to practically accomplish this object or result; that is to say it consists, in connection with an annular water tank, preferably about six feet in external diameter, of a continuously rotating hollow cylinder connected by a suitable stuffing box with a pipe for supplying compressed air thereto, and furnished on its external periphery with two series of pivot lugs or arms, the lugs or arms of one series being staggered with respect to those of the other, and the one series being arranged above the other, of a plurality of swinging arms hinged to said pivot lugs or arms in two sets, one above the other, the pivot lugs of each arm overlapping those of the adjacent swinging arms, thus bringing the swinging arms much closer together and greatly increasing the number of swinging arms that may be arranged in a circle of given diameter, and correspondingly increasing the capacity of the machine and diminishing the space it occupies on the floor of the factory. Each of the swinging arms is furnished with an adjustable seat plate or clamp against which one end of the can to be tested bears. Each of the swinging arms has a central sleeve portion in which is mounted a reciprocating tube or pipe connecting at its inner end through a flexible hose or pipe with the interior of the rotating compressed air cylinder. And this reciprocating pipe or tube is furnished, preferably at its outer end, with a valve shell and a movable valve or piston furnished at its outer end with a rubber pad or clamp to bear against and close the open end or head of the can, and having an opening through the same for admission of compressed air to the can when the can is clamped between the end plate carried by the swinging arm and the rubber pad, which is connected to the valve piston.

A rubber or other spring inserted between the valve shell and the valve or its piston, holds the valve normally closed, so that no air can escape from the compressed air cylinder except when a can is clamped between the two can clamps. The act of clamping the can thus itself automatically opens the air communication between the can and the compressed air cylinder, and the moment the inner or rubber pad clamp is retracted to release the can the compressed air communication is automatically closed. The reciprocating tube or pipe is reciprocated for the purpose of receiving, clamping and discharging the can by means of a lever, the short arm of which is connected by a link with said tube or pipe, or with the valve shell secured thereto. This lever is automatically operated as the compressed air cylinder rotates by its engagement with a stationary stop or projection on the frame of the machine. Each of the swinging arms is provided with an anti-friction roller, which travels upon a sinuous track on the frame of the machine, the rollers on the upper set of swinging arms traveling on one sinuous track, and those on the lower set of swinging arms traveling upon another sinuous track, so that all the cans on all the arms will be similarly immersed in the water tank, notwithstanding the fact that one set is hinged to the rotating air cylinder above the other set, one of the tracks being slightly above the other.

My invention also consists in the novel construction of parts and devices and in the novel combinations of parts and devices herein shown or described.

In the accompanying drawing, forming a part of this specification, Figure 1 is a central vertical section of a machine embodying our invention. Fig. 2 is a detail vertical section showing in elevation one of the lower sets of swinging arms. Fig. 3 is a detail view, partly in section, showing the can head feed chute and coöperating parts. Fig. 4 is a partial plan view. Fig. 5 is a detail plan view showing the devices for causing the discharge of defective cans and Fig. 6 is a detail elevation of the same. Fig. 7 is a detail front elevation showing one pair of pivot lugs or arms on the rotating cylinder, one upper pivot lug and one lower pivot lug. Fig. 8 is an enlarged bottom view showing one of the swinging arms and the parts connected thereto. Fig. 9 is a detail vertical section through one of the swinging arms. Fig. 10 is a detail view similar to Fig. 9, but showing the parts in different position, that is to say when no can is present between the clamps. Figs. 11 and 12 are detail views showing a slightly modified construction, the valve being located at the inner instead of at the outer end of the reciprocating tube.

In the drawing A represents the frame of the machine.

B is a continuously rotating air cylinder, the same having a stuffing box connection b b^1 with a stationary compressed air supply pipe B^1 supported on a suitable bracket A^1 attached to the frame of the machine. The compressed air cylinder B is continuously rotated by the driving shaft C, having pulley C^1, by the connecting bevel gears C^2 C^3, shaft C^4 and spur gear C^5 meshing with a spur gear B^2 on the hub of the air cylinder B. Anti-friction or ball bearings b^2 b^3 b^4 are preferably interposed between the gear B^2 and the bed plate A^2 of the frame. The rotating air cylinder B has a short shaft B^4 also connecting it with the frame A.

The compressed air cylinder B is provided on its outer periphery with two sets or series of pivot lugs or arms b^5 b^6, one slightly above the other so that the swinging arms D D^1 pivoted or hinged thereto may be staggered in respect to each other, and so that the pivot ears d d of the one may overlap the pivot ears d^1 d^1 of the other, and thus greatly increase the number of swinging arms that may be combined with the compressed air cylinder B without increasing its diameter, and the consequent diameter of the machine as a whole. The pivot arms or lugs b^5 b^6 are preferably not cast integral with the cylinder B, but are formed in pairs on plates B^3 secured thereto by screws b^7, the outer periphery of the cylinder B having flat faces to receive the pivot arm plates B^3. This materially cheapens the manufacture of the machine, and enables a broken pivot arm to be readily replaced. Each of the swinging arms D D^1 is thus hinged to and carried continuously around by the rotating compressed air cylinder. Each of the swinging arms D D^1 is provided with an adjustable clamp, disk, or plate D^2 at its outer end for the outer end of the can X to bear against. The bearing plate D^2 is adjusted by nuts d^2 d^2 on the threaded rods or extensions d^3 of the swinging arms D D^1. Each of the swinging arms D D^1 is provided with rollers d^4 d^5 which travel upon sinuous tracks E E^1, on the frame of the machine, the upper track E being for the upper set of swinging arms D which are hinged to the upper set of pivot lugs b^5, and the lower track E^1 being for the rollers d^5 on the lower set of swinging arms D^1, which are hinged to the lower set of pivot lugs b^6. Each of the swinging arms D D^1 has a central hollow sleeve portion d^6 furnished with a projection or lug d^7.

F F are reciprocating tubes or pipes mounted to reciprocate one in each of the swinging arms D D^1, the sleeve portion d^6 of the swinging arm and the threaded sleeve or bearing d^8 secured thereto serving as a bearing or guide way for the pipe or tube F to reciprocate in. The tube F is in open communication with the interior of the compressed air cylinder B through the elbow coupling f and flexible tube or hose f^1. Each of the sliding tubes F has secured thereto, preferably at its outer end, a valve shell F^1, having a screw plug or sleeve F^2 in which reciprocates a piston-like valve F^3 furnished with a central bore or opening f^2 and a radial port f^3, and cross grooves f^4 f^5 in its end face, which piston or valve F^3 is furnished on its outer end with an elastic can clamp or rubber pad F^4 which bears against the inner end of the can X and closes the mouth thereof or opening therein when the can is clamped between the reciprocating clamp F^4 and the opposing clamp D^2. The rubber or elastic clamp F^4 is secured to a flanged disk F^5 on the piston F^3 by a nut F^6 on the threaded end of the valve piston F^3. A packing f^6 is interposed between the valve shell F^1 and the threaded sleeve or plug F^2. A rubber or other spring F^7 is interposed between the valve piston and the valve shell to hold the valve normally closed, one end of the spring preferably bearing against the flanged disk F^5 on the valve piston, and its other end against the screw plug F^2 which is secured to the valve shell. Each of the valve—valve shell—and movable can clamp—carrying, reciprocating tubes F are reciprocated on its swinging arm D or D^1, as required to clamp a can between the clamps D^2 and F^4, as the compressed air cylinder B rotates, by means

of a lever G connected by a pivot pin g to the lug d^7 on the swinging arm D or D^1, and having a pivoted link G^1 connected by a pivot pin g^1 to the sliding tube F. The link G^1 is preferably connected to the sliding tube F through the valve shell F^1 secured to said tube. The can clamp operating lever G is automatically operated to retract the movable can clamp F^4 as the compressed air cylinder B rotates, by means of a stationary stop or projection H on the frame of the machine, which is preferably furnished with an anti-friction roller h. And the can clamp operating lever G is automatically operated to clamp the can when the clamps D^2 F^4 are beneath the can feed chute K by means of a stationary projection H^1 on the frame of the machine which the lever G engages or comes in contact with as the compressed air cylinder B rotates. The stop pin or projection H^1 is preferably furnished with an anti-friction roller h^1.

To cause the cans X X to be tested to automatically feed, one by one, into position between the can clamps D^2 F^4 and be sustained in position in registry with said clamps until the clamps close upon the can, the can feed chute K, which is preferably arranged substantially vertical, is provided with a bottom plate, rest or support K^1, which sustains the column of cans in the feed chute K, and the rods or extensions d^3 of the swinging arms D D^1, are furnished with can supporting bridges d^9, which bridge the space between the adjacent swinging arms D D^1 on a level with the upper surface of the lowermost can resting upon the can support K^1. The can supporting bridges d^9 are preferably vertically and laterally adjustable by set screws d^{10} and supplemental brackets d^{11}, having set screws d^{12}, to adapt the machine for operation upon cans of different diameters. As the compressed air cylinder B continuously rotates under the can feed chute K, the lowermost can in the can feed chute drops into position between each pair of can clamps D^2 F^4 as the same pass under the fed chute; and the cans are thus automatically fed between the can clamps and automatically clamped thereby.

As the clamp F^4 closes upon the can by reason of the engagement of the lever G with the stop H^1, its action is first to close the open end of the can and grasp the can between the clamps D^2 F^4, and then, as the rubber or elastic clamp F^4 compresses, the spring F^7 is also compressed, thus causing the valve F^3 to open or move in respect to the valve shell F^1, and thus open or establish communication between the interior of the can and the compressed air cylinder B, thus filling the can with compressed air. The engagement of the can clamp operating lever G with the stationary stop H^1 on the frame of the machine, carries the short arm g^2 of said lever and the link G^1 past the center or straight line, thus holding or locking the clamp F^4 in its extended or can-clamping position. The further rotation of the compressed air cylinder B causes the can, filled with compressed air and in open air communication with the compressed air cylinder B, to be immersed in the water of the annular tank A^5. If the can is a perfect one no air bubbles will escape, and the further rotation of the compressed air cylinder will cause the can clamping lever G to be engaged by the stationary stop H and the can to be discharged into the runway or chute K^2 for perfect cans. If, however, the can is a leaky or imperfect one, this will be indicated to the attendant by the escaping air bubbles rising through the water of the tank, and the attendant by turning the trip lever M, with which each of the swinging arms D D^1 is provided, will cause the defective can to be discharged into the runway or chute K^3 for defective cans, and thus be separated from the perfect cans. The trip lever or device M performs this function when thus turned, as above described, by engaging and moving a movable stop N, mounted on the frame of the machine in advance of the stop H, which engages the clamp lever G to discharge the perfect cans, and thus moving said movable stop N into position for engaging the clamp lever G and thus unclamping the can and discharging it into the runway K^3 for defective cans, before coming to the stop H and the runway K^2 for the perfect cans. The trip lever M and the movable stop N may both be of any suitable form or construction adapted to accomplish this function. The trip lever or device M, however, preferably has both a turning or rotary movement and a sliding or reciprocating movement, and it preferably comprises a handle portion m, a shaft m^1 and an operating arm m^2 which engages the movable stop N. The bearing M^1 for this trip device, has a slot m^3 into which the handle arm m drops when it is given a quarter turn by the attendant. A spring m^4 causes the trip device M to reciprocate with certainty when its handle arm is given its quarter turn. The movable stop N is preferably shaped about as illustrated in the drawing, and is pivoted at n to the stationary frame of the machine, or to a bracket N^1 thereon, and it is provided with a curved or inclined surface n^1 which is engaged by the operating arm m^2 of the trip device M, when said trip device M is given a quarter turn and its handle arm m^2 drops into the slot m^3 thus moving the movable stop N into position for engagement with the can clamp operating lever G.

The trip device M is automatically returned to its normal position by a stationary incline P on a bracket P^1 on the frame of

the machine, which engages the lower end of the trip lever shaft m^1, and thus reciprocates it, or pushes it upward, and by a pin or stop P^2, which engages the operating arm m^2 of the trip device M, and gives it a quarter turn backward to its normal position.

In the modification illustrated in Figs. 11 and 12, the valve shell F^1 and valve F^2 are located at the inner end of the sliding tube F, instead of at the outer end thereof, and the hollow stem F^9 of the valve is elongated, thus giving a longer bearing and better support thereto and to the rubber pad can clamp F^4 carried thereby. And in this modification the spring F^7 between the valve shell and its piston for holding the valve normally closed, is shown as a coil spring, instead of a rubber spring, as in Figs. 9 and 10.

The can feed chute K is supported on a bracket A^1 removably secured to the main frame A, and the driving shaft C and shaft C^4 are likewise journaled upon removable brackets A^3 A^4, respectively, and adapted to be attached to the main frame in different positions. In order that the machine may be used as a right or left hand machine, and receive and discharge the cans from any direction as desired, the frame is made in two sections, an upper section and a lower section, adapted to be adjusted or turned in different positions in respect to each other, so that the feed chute K and discharge chutes K^2 K^3, which are mounted upon or carried by the upper section of the frame may be arranged in different relation to the driving shaft C and driving mechanism which are mounted on the lower section of the frame. The upper section of the frame has its bed plate A^2 thus adjustably secured to the flange or top plate A^6 of the lower section of the frame by clamps a and clamp screws a^1. By simply loosening these clamps the upper part of the stationary frame may be turned half or quarter around and thus differently arranged in respect to the driving mechanism.

We claim:

1. In a can testing machine, the combination with a water or liquid holding tank, of a rotating compressed air cylinder or reservoir, furnished with an upper series and a lower series of pivot lugs or arms, an upper and a lower set of swinging arms hinged thereto, a pair of can clamps on each of said swinging arms, and a valved air pipe or communication between said compressed air reservoir and one of the can clamps on each of said arms, and two sinuous tracks, one for each set of said swinging arms to cause the cans in the clamp to be immersed in the liquid of the tank as the compressed air cylinder or reservoir rotates, a can feed chute, a support for the cans beneath the lower end of said feed chute, lateral bridges on said swinging arms bridging the space between adjacent swinging arms to support the cans in the feed chute, a discharge runway for perfect cans, a discharge runway for defective cans, a can clamp operating lever and connecting link, stationary stops on the frame of the machine to engage the can clamp operating lever and automatically open and close the clamp, a trip device on each of said swinging arms, and a movable stop engaged by said trip device when turned to move it into position for discharging a defective can, and a device on the stationary frame of the machine for returning the trip device to its normal position, substantially as specified.

2. In a can testing machine, the combination with a tank, of a rotary compressed air reservoir and two sets of swinging arms hinged thereto, one set above the other, and furnished with can clamps, substantially as specified.

3. In a can testing machine, a rotating compressed air reservoir furnished with two sets of pivot lugs, one above the other, and two sets of swinging arms hinged to said pivot lugs, the swinging arms of one set being staggered in respect to those of the other set, substantially as specified.

4. In a can testing machine, the combination with an annular tank, of a rotating compressed air reservoir provided with an upper and lower set of pivot lugs, and swinging arms having pivot ears connected to said pivot lugs, the pivot ears of one set of said arms overlapping the pivot ears of the other set, substantially as specified.

5. In a can testing machine, the combination with a can feed chute, of a rotating compressed air cylinder or reservoir, a series of swinging arms hinged thereto, a pair of can clamps on each of said hinged arms, and a bridge extending between the adjacent swinging arms to support the cans in the can feed chute as the swinging arms move beneath the same, substantially as specified.

6. In a can testing machine, the combination with a can feed chute, of a can support at the lower end of said can feed chute, a rotating compressed air cylinder or reservoir, a series of swinging arms hinged thereto, a pair of can clamps on each of said hinged arms, and bridges extending between the adjacent swinging arms to support the cans in the can feed chute as the swinging arms move beneath the same, substantially as specified.

7. In a can testing machine, the combination with a tank, of a rotating compressed air reservoir, a series of radial swinging arms hinged thereto, a stationary can clamp on each of said swinging arms, a reciprocating tube on each of said swinging arms, an air pipe connecting each of said tubes with said compressed air reservoir, a valve shell and a reciprocating piston or valve connected with each of said reciprocating tubes, a rubber or

elastic can clamp at the outer end of the stem of each of said valves or pistons, a spring interposed between each of said valves or pistons and its valve shell for holding the valve normally closed, and means for reciprocating each of said sliding tubes as the compressed air reservoir revolves and thus automatically clamping and closing or sealing the can and opening the valve to admit compressed air to the closed or sealed can, substantially as specified.

8. In a can testing machine, the combination with a rotating compressed air reservoir, a swinging arm hinged thereto, a pair of can clamps, a reciprocating tube on said swinging arm, a connection between said tube and said compressed air reservoir, and a valve having a stem connected with one of said can clamps, whereby the valve is opened by the act of closing the clamp on the can, substantially as specified.

9. In a can testing machine, the combination with a rotating compressed air reservoir, a swinging arm hinged thereto, a pair of can clamps, a reciprocating tube on said swinging arm, a connection between said tube and said compressed air reservoir, a valve having a stem connected with one of said can clamps whereby the valve is opened by the act of closing the clamp on the can, and a spring for holding said valve normally closed, substantially as specified.

10. In a can testing machine, the combination with a rotating compressed air reservoir, a swinging arm hinged thereto, a pair of can clamps, a reciprocating tube on said swinging arm, a connection between said tube and said compressed air reservoir, a valve having a stem connected with one of said can clamps, whereby the valve is opened by the act of closing the clamp on the can, a spring for holding said valve normally closed, and a pivoted lever and connecting link for reciprocating said sliding tube, substantially as specified.

11. In a can testing machine, the combination with a rotating compressed air reservoir, a swinging arm hinged thereto, a pair of can clamps, a reciprocating tube on said swinging arm, a connection between said tube and said compressed air reservoir, a valve having a stem connected with one of said can clamps, whereby the valve is opened by the act of closing the clamp on the can, a spring for holding said valve normally closed, a pivoted lever and connecting link for reciprocating said sliding tube, and a stationary stop on the frame of the machine for automatically operating said lever, substantially as specified.

12. In a can testing machine, the combination with a rotating compressed air reservoir, a swinging arm hinged thereto, a pair of can clamps, a reciprocating tube on said swinging arm, a connection between said tube and said compressed air reservoir, a valve having a stem connected with one of said can clamps, whereby the valve is opened by the act of closing the clamp on the can, a spring for holding said valve normally closed, a pivoted lever and connecting link for reciprocating said sliding tube, a stationary stop on the frame of the machine for automatically operating said lever, and a second stationary stop on the frame of the machine for automatically operating said lever to release or discharge the can, substantially as specified.

13. In a can testing machine, the combination with a rotating compressed air reservoir, a swinging arm hinged thereto, a pair of can clamps, a reciprocating tube on said swinging arm, a connection between said tube and said compressed air reservoir, a valve having a stem connected with one of said can clamps, whereby the valve is opened by the act of closing the clamp on the can, a spring for holding said valve normally closed, a pivoted lever and connecting link for reciprocating said sliding tube, a stationary stop on the frame of the machine for automatically operating said lever, a second stationary stop on the frame of the machine for automatically operating said lever to release or discharge the can, a trip device on said swinging arm, and a movable stop actuated by said trip device to move it into position for engagement with said lever to discharge defective cans, substantially as specified.

14. In a can testing machine, a rotating compressed air reservoir furnished with an upper and lower set of pivot lugs, in combination with two sets of swinging arms hinged thereto, one set above the other, each of said swinging arms being furnished with can clamps and having a compressed air communication substantially as specified.

15. In a can testing machine, a rotating compressed air reservoir having a series of removable pivot lug plates or brackets removably secured thereto, each furnished with an upper and a lower pivot lug, substantially as specified.

16. In a can testing machine, the combination with a rotating compressed air cylinder or reservoir, of a series of swinging arms hinged thereto, a tank, a sinuous track for supporting said arms, a stationary can clamp on each of said arms, a reciprocating tube on each of said arms having a connection with said compressed air reservoir, a valve shell and a reciprocating valve or piston having at its outer end a rubber pad or elastic can clamp, substantially as specified.

17. In a can testing machine, the combination with a rotating compressed air cylinder or reservoir, of a series of swinging arms hinged thereto, a tank, a sinuous track for supporting said arms, a stationary can

clamp on each of said arms, a reciprocating tube on each of said arms having a connection with said compressed air reservoir, a valve shell, a reciprocating valve or piston having at its outer end a rubber pad or elastic can clamp, and a spring for holding said valve normally closed, substantially as specified.

18. In a can testing machine, the combination with a rotating compressed air cylinder or reservoir, of a series of swinging arms hinged thereto, a tank, a sinuous track for supporting said arms, a stationary can clamp on each of said arms, a reciprocating tube on each of said arms having a connection with said compressed air reservoir, a valve shell, a reciprocating valve or piston having at its outer end a rubber pad or elastic can clamp, a spring for holding said valve normally closed, and a lever and connecting link for reciprocating said sliding tube, substantially as specified.

19. In a can testing machine, the combination with a rotating compressed air cylinder or reservoir, of a series of swinging arms hinged thereto, a tank, a sinuous track for supporting said arms, a stationary can clamp on each of said arms, a reciprocating tube on each of said arms having a connection with said compressed air reservoir, a valve shell, a reciprocating valve or piston having at its outer end a rubber pad or elastic can clamp, a spring for holding said valve normally closed, a lever and connecting link for reciprocating said sliding tube, and a stationary stop engaging said lever to move said sliding tube, substantially as specified.

20. In a can testing machine, the combination with a can feed chute, of a can support or rest beneath the chute, a series of swinging arms, a movable support or carrier for said swinging arms, a pair of clamps on each of said swinging arms, and bridges extending between the adjacent swinging arms to support the cans in the can chute, substantially as specified.

21. In a can testing machine, the combination with a tank, of a can feed chute above the tank, a can support above the tank and beneath the lower end of the can feed chute, a series of radial swinging arms provided each with a pair of clamps, a rotating carrier for said swinging arms, a stationary sinuous track upon which said swinging arms ride and by which the cans are immersed in and conveyed through the liquid in the tank and raised out of the same and by which sinuous track the clamps on each of said arms are presented in turn to receive a can from the can feed chute as the carrier rotates, means for rotating the carrier, and coöperating means for automatically operating the movable clamp to clamp and release the can, substantially as specified.

22. In a can testing machine, the combination with a tank, of a can feed chute, a can support or rest beneath the chute, a rotating compressed air reservoir, a series of radial arms connected thereto, a pair of can clamps on each of said radial arms, bridges extending between adjacent radial arms to support the cans in the can chute, and a valved air pipe on each of said radial arms, and means for closing the can clamps to clamp and release the cans, substantially as specified.

23. In a can testing machine, the combination with a rotating compressed air reservoir having a series of swinging arms hinged thereto, a pair of can clamps mounted on each of said arms, a sinuous track supporting the arms, a driving shaft, and a frame comprising a lower section upon which the driving mechanism is mounted, and an upper section adapted to turn on the lower section and movably secured thereto to adapt the machine to be used as a right hand or left hand machine and can feed discharge chutes mounted on the upper sections of the frame, substantially as specified.

24. In a can testing machine, the combination with a frame having a lower section and an upper section adapted to be secured in different positions on the lower section, of a series of rotating arms furnished with can clamps mounted on the upper section of the frame, and can feed and discharge chutes mounted on the upper section of the frame and a driving mechanism mounted on the lower section of the frame substantially as specified.

25. In a can testing machine, the combination with a frame having a lower section and an upper section adapted to be turned to and be secured in different positions on the lower section, of a compressed air reservoir mounted to rotate on the upper section of the frame, and a series of arms furnished each with can clamps, and can feed and discharge chutes mounted on the upper section of the frame and a driving mechanism mounted on the lower section of the frame substantially as specified.

26. In a can testing machine, the combination with a frame having a lower section and an upper section adapted to be turned to and be secured in different positions on the lower section, of a compressed air reservoir mounted to rotate on the upper section of the frame, a series of arms furnished each with can clamps, and a can feed chute for delivering the cans to the clamps, and a can discharge chute, both of said chutes being mounted on the upper section of the frame, and a driving mechanism mounted on the lower section of the frame substantially as specified.

27. In a can testing machine, the combi-

nation with a frame having a lower section and an upper section adapted to be turned to and be secured in different positions on the lower section, of a compressed air reservoir mounted to rotate on the upper section of the frame, a series of arms furnished each with can clamps, a can feed chute for delivering the cans to the clamps, and a can discharge chute, said can feed and discharge chutes being mounted on the upper section of the frame and a driving mechanism mounted on the lower section of the frame substantially as specified.

FRANK RUDOLPHI.
CHARLES J. NELSON.

Witnesses:
H. M. MUNDAY,
EDMUND ADCOCK.