No. 704,480. Patented July 8, 1902.

G. F. LEIGER.

CAN TESTING MACHINE.

(Application filed Oct. 4, 1901.)

(No Model.) 2 Sheets—Sheet 1.

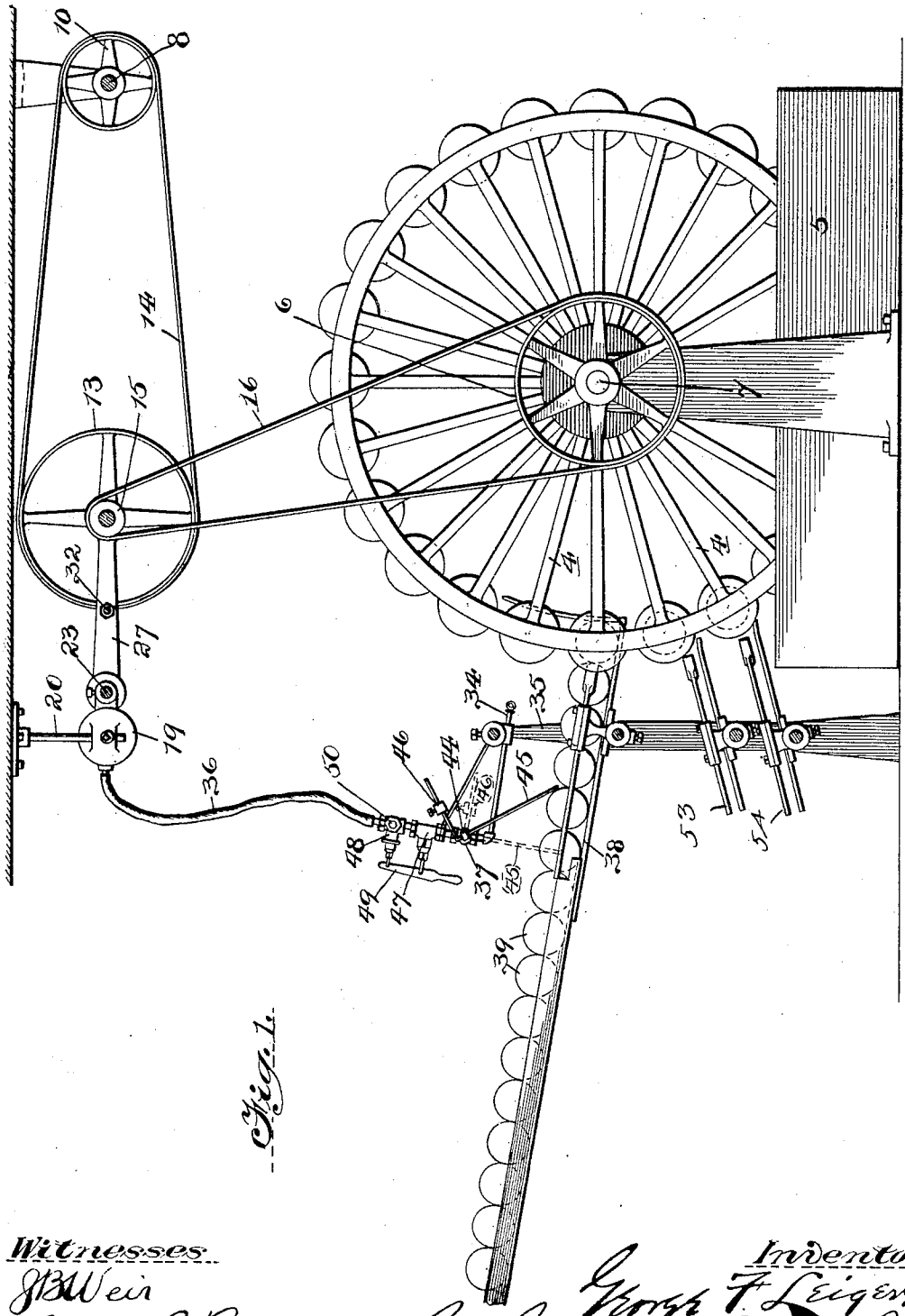

Fig. 1.

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Fig. 2.

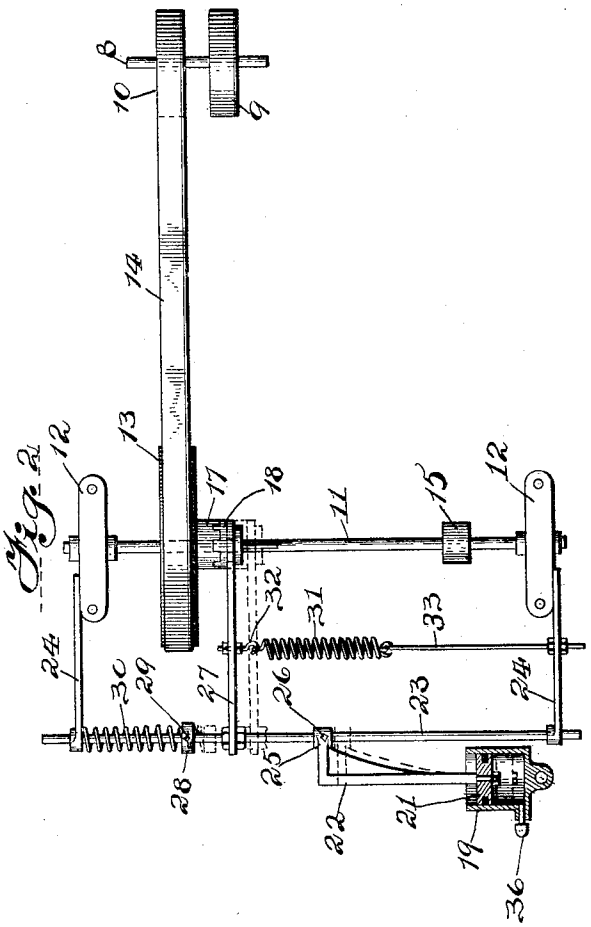
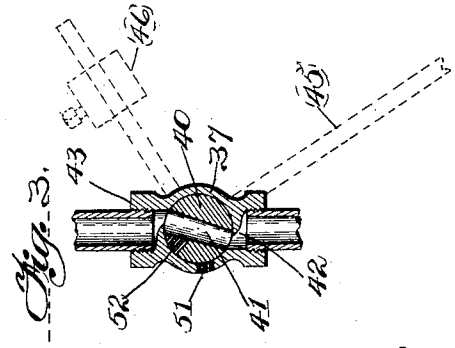


Fig. 3.



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UNITED STATES PATENT OFFICE.

GEORGE F. LEIGER, OF CHICAGO, ILLINOIS, ASSIGNOR OF THREE-FOURTHS TO LEWIS BENEDICT, OF CHICAGO, ILLINOIS.

CAN-TESTING MACHINE.

SPECIFICATION forming part of Letters Patent No. 704,480, dated July 8, 1902.

Application filed October 4, 1901. Serial No. 77,599. (No model.)

To all whom it may concern:

Be it known that I, GEORGE F. LEIGER, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Can-Testing Machines, of which the following is a specification, reference being had to the accompanying drawings.

My invention relates to can-testing machines, particularly of the class shown and described in my application for Letters Patent, Serial No. 56,280, filed April 17, 1901; and its object is to provide a new and improved means for automatically stopping the machine when the supply of cans in the inclined chute along which the cans are fed into the machine is free or nearly free from cans.

In the drawings, Figure 1 is a side elevation of the machine. Fig. 2 is a detail, being a top or plan view of the shifting mechanism by which the machine is stopped or started; and Fig. 3 is an enlarged detail, being a vertical section of a valve controlling the shifting mechanism.

Referring to the drawings, 4 indicates a carrier adapted to receive a continuous supply of cans and to be rotated through a trough 5, containing water for the purpose of testing the cans. The carrier is preferably of the form shown and contains the mechanism shown and described in my application for Letters Patent above named, but may be of any other approved form and character. As my invention does not relate to the details of the carrier or to the method in which the cans are tested and ejected from the carrier after being tested, the details of the carrier and can-testing mechanism are not shown. As said above, they may be of the kind described in my said application for Letters Patent or of any other approved form and character.

6 indicates a pulley secured to the shaft 7 of the carrier 4.

8 indicates the main driving-shaft, which is driven by any appropriate power. (Not shown.)

9 indicates a pulley which is keyed or otherwise secured upon the driving-shaft 8 and is adapted to be connected by a belt to any suitable driving-machine.

10 indicates a pulley which is keyed or otherwise secured to the driving-shaft 8.

11 indicates a shaft which is carried by brackets 12 and is journaled therein.

13 indicates a pulley which is rotatably mounted on the shaft 11.

14 indicates a belt which connects the pulleys 13 and 10.

15 indicates a pulley which is keyed or otherwise secured to the shaft 11 and is connected with the pulley 6 by a belt 16.

The pulley 13 carries upon its hub a clutch member 17.

18 indicates another clutch member which is feathered upon the shaft 11, so as to be capable of sliding longitudinally of said shaft, but to be rotated therewith.

19 indicates a cylinder which is supported by a suitable support 20, preferably from the ceiling of the room in which the machine is placed; but of course it may be supported in any other suitable manner. 21 indicates a piston moving in said cylinder and provided with a piston-rod 22.

23 indicates a rod which is slidingly mounted in supports 24 and passes through a block 25 upon the inner end of the bent portion of the piston-rod 22 and is secured to said block by a set-screw 26. When the piston is moved in or out of the cylinder, as is hereinafter described, the rod 23 is slid in one direction or the other in the supports 24.

27 indicates an arm secured at one end to the rod 23 and engaging at its other end with the clutch member 18, whereby by the longitudinal movement of the rod 23 in one direction or the other the clutch member 18 is carried into or out of engagement with the clutch member 17 on the hub of the pulley 13.

28 indicates a block, which is secured upon the rod 23 by means of a set-screw 29.

30 indicates a spiral spring, which bears at one end upon the block 28 and at the other end upon the supports 24 and tends normally by its expansion to move the rod 23, so as to throw the clutch member 18 out of engagement with the clutch member 17.

31 indicates a spiral spring, which is con-

nected by a hook 32 with the arm 27 and by a link 33 with the arm 24 and tends by its contraction to carry the clutch member 18 away from the clutch member 17 when left free to act.

34 indicates a pipe, which is carried upon one of the supports 35 and is connected with any suitable source of compressed-air supply, which may be of any suitable well-known kind and description and may be located at any convenient point, and consequently is not shown. The pipe 34 is connected by a flexible tube 36 with the cylinder 19 below the piston 21 and opens into said cylinder below said piston.

37 indicates a valve-chamber, which is located in the pipe 34 above an inclined track 38, down which the cans 39 are fed into the carrier 4. The track 38 may be of any well-known description and is preferably of the kind shown and described in my application for Letters Patent above named.

40 indicates a rotary valve mounted in the valve-chamber 37 and provided with a passage 41, which is adapted when the parts are in the position shown in Fig. 3 to communicate with openings 42 43 in the said valve-chamber 37, so as to leave a free passage for compressed air through the supply-pipe 34 into the cylinder 19. The valve 40 is provided with a valve-stem 44, in which is mounted a rod 45. The rod 45 is bent approximately at right angles above the valve-stem 44 and carries upon the bent portion a weight 46. The rod 45 is so placed in the valve as to project downward above the trough 38 and is adjustable in said valve-stem, so that its lower end will be contacted by the cans 39 as they move down the track or chute 38. When there are no cans in the track or chute, the weight 46 will throw the arm of the rod 45, which carries the weight, downward and cause the parts to assume the position shown in dotted lines in Fig. 1, rotating the valve 37, and by bringing the passage 40 out of alinement with the openings 42 43 close the passage through the supply-pipe 34 to the cylinder 19. When, however, there are cans in the track, as shown in Fig. 1, the cans rolling down the track will contact the lower end of the adjustable rod 45 and raise the same to the position shown in solid lines in Fig. 1, turning the valve into the position shown in Fig. 3 and opening a passage through the pipe 34.

47 48 indicate ordinary gate-valves which are placed in the supply-pipe 34 and are controlled by a hand-lever 49. The gate-valve 48 is adapted to open and close an opening 50 into the air, so as to permit the escape of compressed air from the cylinder 19 and pipe 36 when the said gate-valve is open. The gate-valve 47 controls the pipe 34, connected with the source of supply.

51 indicates a series of openings in the valve-chamber 37, and 52 indicates a series of openings between the passage 41 and the outer periphery of the rotary valve 40. When the parts are in the position shown in Fig. 3, these openings 51 52 are closed; but when the valve is rotated so as to shut off the supply of compressed air to the cylinder the passage 42 is closed, the lower end of the passage 41 will register with the openings 51, and the openings 51 will register with the passage 43, so that when the valve 40 is closed the compressed air in the cylinder 19 may escape into the outer air and relieve the pressure behind the piston.

53 54, Fig. 1, indicate discharging-chutes into which, respectively, the perfect and leaky cans are automatically discharged by the carrier 4. The discharging mechanism is preferably of the form shown and described by me in my application above named, but may be of any approved form and description, and as the said automatic mechanism for discharging perfect and leaky cans and the chutes into which they are discharged form no part of my present invention they need no further description.

The operation of the above-described devices is as follows: The pulley 13 is of course being constantly driven through the main driving-shaft 8 and the pulley 10; but as the pulley 13 rotates freely upon the shaft 11 the shaft 11 is not driven, and consequently the carrier 4 is not driven. The track or chute 38 is then filled with cans, as shown in Fig. 1, which causes the raising of the lower end of the rod 45 against the weight 46, opening the valve 40, as shown in Fig. 3. The hand-lever 49 is then compressed to open the gate-valve 47, which causes the compressed air to flow through the pipe 36 into the cylinder 19 below the piston 21. This causes the piston to move outward, carrying with it the piston-rod and moving the rod 23, and with it the arm 27, against the action of the springs 30 31. This causes the clutch member 18 to slide upon the shaft 11 and to engage with the clutch member 17 of the pulley 13. This causes the shaft 11 to rotate and rotates the carrier 4. As soon as the last can in the chute or track 38 has passed the rod 45 the action of the weight 46 will cause the lower end of the rod 45 to drop into the position shown in dotted lines in Fig. 1, closing the valve 40 and shutting off the supply of compressed air from the cylinder 19. The openings 52 are by this movement brought into register with the passage 43 and the lower end of the passage 41 in the valve 40 brought into register with the openings 51, thus permitting the escape of compressed air behind the piston 19 into the open air and restoring normal atmospheric pressure below said piston. The springs 30 31 are thus left free to operate, moving the rod 23, and with it the piston-rod 22, to the bottom of the cylinder, and, of course, carrying with them the arm 27, so as to throw the clutch member 18 out of engagement with the clutch member 17, thus stopping the machine. In case it is desirable at any time to

stop the machine before the supply of cans is exhausted, as above set forth, the lever 49 is operated to close the gate-valve 47 and open the gate-valve 48, which permits the escape of the compressed air from the cylinder 19 below the piston 21 into the open air through the opening 50, when, of course, the operations above described are performed and the clutch members thrown out of engagement.

As the gate-valves 47 48 and the hand-lever 49 form no part of my present invention and may be of any approved form and description, they are not more fully shown and described here, but are described only in so far as their operation relates to the starting or stopping of the machine.

That which I claim as my invention, and desire to secure by Letters Patent, is—

1. The combination with a carrier, a chute adapted to direct cans to said carrier, a driving-shaft connected with said carrier, and clutch mechanism on said shaft, of pneumatically-operated mechanism for moving said clutch mechanism into engagement to drive said shaft and said carrier, and means operated by cans in said chute to control the air supplied to said pneumatically-operated mechanism, substantially as described.

2. The combination with a carrier, a chute adapted to direct cans to said carrier, a driving-shaft connected with said carrier, and clutch mechanism on said shaft, of pneumatically-operated mechanism for moving said clutch mechanism into engagement to drive said shaft and said carrier, a valve controlling said pneumatically-operated mechanism, and mechanism adapted by the contact of cans in said chute to open said valve and close the same automatically when not contacted by a can, substantially as described.

3. The combination with a carrier, a chute adapted to direct cans to said carrier, a driving-shaft connected with said carrier, and clutch mechanism on said shaft, of mechanism adapted to be operated by compressed air to throw said clutch mechanism into engagement to drive said shaft and said carrier, means controlled by cans in said chute to admit air under pressure to the mechanism which operates said clutch mechanism to throw said clutch mechanism into engagement, and means to automatically release said clutch mechanism when said can-controlled means is not contacted by a can in the chute, substantially as described.

4. The combination with a carrier, a chute adapted to direct cans to said carrier, a driving-shaft connected with said carrier, and clutch mechanism on said shaft, of mechanism operated by air-pressure to throw said clutch mechanism into engagement to drive said shaft and said carrier, a valve controlling the passage of compressed air to said clutch-moving mechanism, and mechanism adapted by the contact of cans in said chute to open said valve and close the same automatically when not contacted by a can, substantially as described.

5. The combination with a carrier, a chute adapted to direct cans to said carrier, a driving-shaft connected with said carrier, a driven pulley rotatably mounted on said shaft and having upon it one member of a clutch mechanism, and a second clutch member slidingly mounted on said shaft and adapted to engage with the clutch member on said pulley, of a cylinder, a piston mounted in said cylinder and connected with said second clutch member, a tube adapted to lead compressed air to said cylinder, a valve in said tube controlling the passage of compressed air therethrough, a valve-stem adapted to be contacted by cans in said chute and open said valve to permit of the passage of compressed air to said cylinder and to automatically close said valve when not contacted by a can in said chute, and springs adapted to normally hold said clutch members out of engagement, substantially as described.

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