

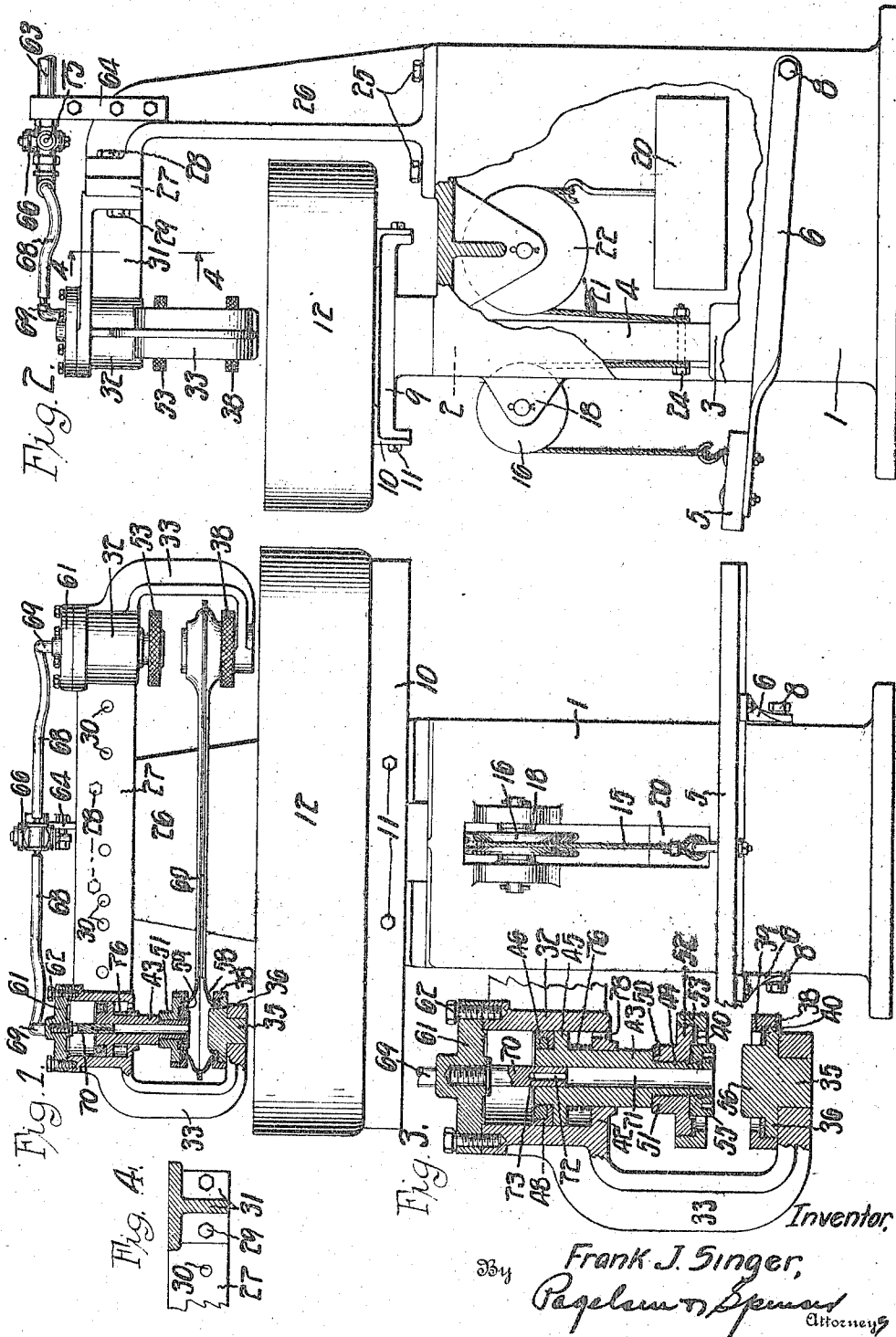
F. J. SINGER.
TESTING MACHINE.

APPLICATION FILED JUNE 13, 1917.

1,286,432.

Patented Dec. 3, 1918.

2 SHEETS—SHEET 1.



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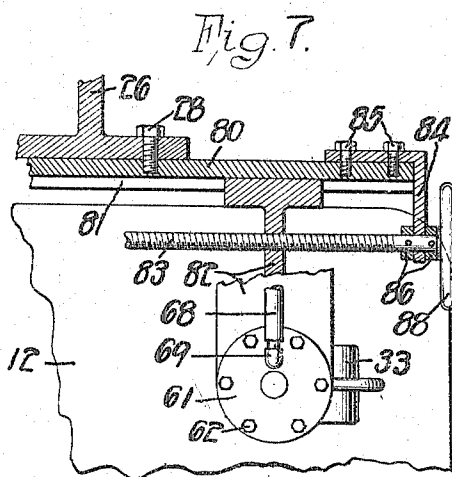
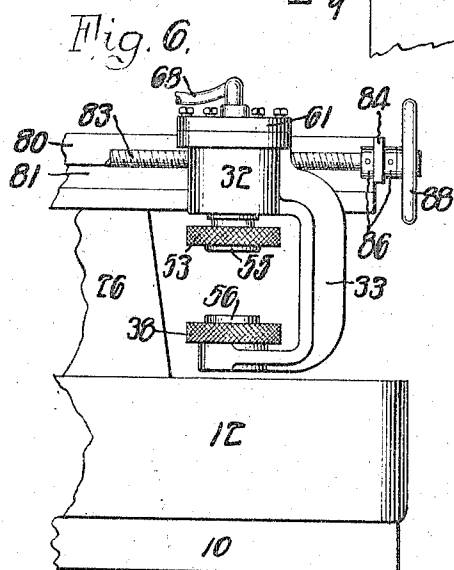
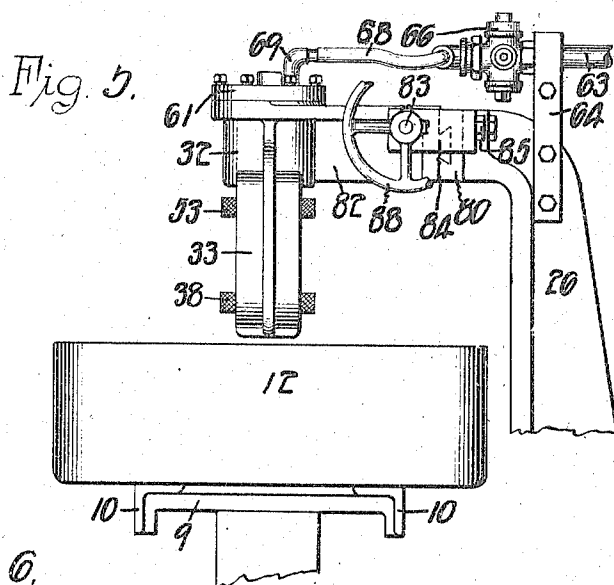
Frank J. Singer,
Patent Attorney

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2 SHEETS—SHEET 2.



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TESTING-MACHINE.

1,286,432.

Specification of Letters Patent.

Patented Dec. 3, 1918.

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To all whom it may concern:

Be it known that I, FRANK J. SINGER, a citizen of the United States, and residing at Detroit, in the county of Wayne and State of Michigan, have invented a new and Improved Testing-Machine, of which the following is a specification.

In the manufacture of radiators it is customary to subject the sections to water pressure in order to detect leakage, but this mode of procedure is necessarily slow. The present invention has for its object to provide means whereby the testing can be accomplished in much less time and more nearly in accordance with the demands of commercial production.

To this end, it consists in a pneumatically operated clamp constructed and arranged to be fitted around the opening or openings in the radiator section, said clamp having means for admitting air under pressure to the section at the close of the clamping movement and also having means for automatically opening the clamp when the supply of air is shut off. It also consists in a tank of such shape and size that a section may be immersed therein while in the clamp (thus enabling the tester to detect leakage by the escape of air through water contained in the tank), together with means for causing a relative movement between the tank and clamp to bring about the immersion. In the embodiment shown, the tank is movable toward and from the clamp, but the tank might be stationary and the clamp movable. The invention further consists in the details of construction shown, described and claimed.

Figures 1 and 2 are, respectively, front and side views showing a preferred embodiment of the invention, parts being broken away. One of the clamps in Fig. 1 is shown closed upon a radiator section, the other being open, but it will be understood that both clamps close simultaneously. Fig. 3 is an enlarged vertical section through one of the clamps. Fig. 4 is a section on the line 4—4 of Fig. 2. Fig. 5 is a fragmentary side view showing a modification. Fig. 6 is a fragmentary front view corresponding thereto. Fig. 7 is a plan view corresponding to Fig. 5, parts being broken away.

The hollow bed of the frame, which may be of any suitable form, appears at 1. As

shown, it is provided with suitable guides 2—3 through which a post 4 is vertically reciprocable when foot pressure is applied to a treadle 5, the arms 6 of which are pivoted at 8 to the frame. The post bears at its top a head 9 that may include the angle irons 10 bolted in place at 11 and arranged to receive the water tank 12, the length and width of which is sufficient to accommodate a section of the radiator or other unit to be tested. The treadle is shown connected to the post by a cable 15 that passes over a sheave 16 carried in bearings 18 on the frame, and both post and tank are counterbalanced by a weight 20 and cable 21 which passes over a sheave 22 hung from the wall 23 of the bed. As shown, the cables 21 and 15 are connected to the lower end of the post by a single bolt 24. The details of this general construction are subject to wide variation.

Secured to the back of the bed by bolts 25 and projecting upwardly therefrom is an arm 26 to which a cross bar 27 is attached by bolts 28; this bar is perforated and threaded at intervals as indicated at 30 to receive cap screws or bolts 29 whereby the forwardly projecting arms 31, each of which is cored out from above and finished to form a cylinder 32, are supported. The arms 31 may thus be adjusted along the bar 27 to correspond to radiators of different length, it being understood that the holes for the screws are spaced to correspond to the several lengths of sections. The metal of the cylinders is continued outwardly, downwardly and inwardly to form U-shaped supports 33 for fixed clamp jaws, each of which has a shank 35 (received in a socket in the inturned lower end of the support) and a flange 36 bearing on the upper face of said end. The flange is threaded to receive a nut 38 (Fig. 4) having an annular inturned rib 39 whereby a rubber or other suitable gasket 40 is held in position.

The lower head 42 of the cylinder 32 is preferably integral therewith and is bored out to receive the hollow piston rod 43, the upper end of which is provided with a suitable piston. The details of the piston may be widely varied, but it is preferred to form integrally with the rod a flange 45 between which and a nut 46 (threaded on the rod) a leather cup 48 is clamped. At its lower end

the piston rod is reduced and threaded at 49 and forms a shoulder 50 against which the thrust from a suitable clamp jaw is received. The jaw preferably comprises the base 51 threaded on the piston rod and also has an externally threaded flange 52, between which and a nut 53 (a duplicate of the nut 38) a gasket 40 is interposed as described above with reference to the lower jaw. A lock nut 55, preferably of substantially the same diameter as the upper end 56 of the fixed jaw, retains the parts in position. As will be observed in Fig. 1, the gasket holding ribs on the nuts 38 and 53 are spaced from the end 56 and the lock nut 55 sufficiently to readily accommodate the flanges 58 and 59 of the radiator section 60 around the openings therein.

The upper cylinder head 61 is held in place by cap screws 62. For the purpose of forcing the movable jaws toward the fixed jaws, compressed air is conducted from a suitable source (not shown) through a pipe 63 (mounted in a member 64 carried by the arm 26), three-way valve 66, flexible branch pipes or hose 68, and fittings 69 to the cylinders. The heads 60 are centrally threaded to receive the valve stems 70, the lower ends of which are in close slidable connection with the wall of the bores 71 of the piston rods. At their lower ends the stems have passages 72 which are automatically put into communication with the interior of the cylinder through lateral passages 73 as the movable jaws approach the limit of their movement toward the fixed jaws,—in other words, at about the time a tight seal has been reached. Therefore, air is automatically admitted to the section as soon as the proper clamping action is secured, and (the tank having been elevated in the meanwhile) the condition of the section is immediately apparent. When the testing is completed, the valve 66 is turned to exhaust air (preferably rather slowly as compared with the rate of feeding) from the section and the cylinders through the exhaust passage 75 in the valve. A spring 76 surrounding the piston rod forces the latter back to normal position (in which the passage 73 is covered), thus releasing the section; the wall 42 is perforated at 78 to allow free movement. The cross-sectional area of the cylinder is, of course, considerably greater than that of the opening into the radiator section.

In the modification, Figs. 5, 6 and 7, the bar 27 is replaced by a guide 80, the front face of which is machined to form a dove tailed groove 81. Slidable along the face of the guide is an arm 82, which corresponds to one of the arms 31. Various means may be employed for shifting the arm along the guide, that preferred being the screw 83 threaded into and extending through the

arm and rotatable in the support 84 which may be attached to the guide by screws 85. Collars 86, pinned to the screw on opposite sides of the support, prevent movement of the screw longitudinally of the guide, and a hand wheel 88 affords means for causing the necessary rotation. The other end of the guide may, of course, be equipped in like manner.

It is evident that the invention is applicable to the testing of various containers other than the sections of radiators; also that the actual details of construction of the various parts are subject to much variation. I do not, therefore, wish to be limited except as indicated by the appended claims.

I claim:—

1. A machine for testing a container which has an opening therein, said machine comprising a clamp having a jaw adapted to have sealing engagement with the wall of the container around the opening, means for causing relative movement between said jaw and said container, means for automatically admitting air under pressure to said container at the close of said relative movement, and means for shutting off the supply of air at will and for thereafter automatically venting the air from the containers at a rate less than that at which it was supplied thereto.

2. A machine for testing a container which has an opening therein, said machine comprising a clamp having a jaw adapted to have sealing engagement with the wall of the container around the opening, pneumatic means for moving the jaw toward and from the container to establish such engagement therewith, and means for automatically admitting air under pressure to said container through the pneumatic means at the close of said relative movement.

3. A machine for testing containers having alined openings therein, said machine comprising a clamp having a pair of jaws constructed and arranged to have sealing engagement with the wall of the container around the corresponding opening, means for causing said jaws to have such engagement with the container, means for automatically admitting air under pressure through one of the jaws to said container when the sealing engagement is substantially completed, and a single valve for shutting off the supply of air and restrictedly venting the air from the container.

4. A machine for testing containers having spaced openings therein, said machine comprising a pair of spaced clamp jaws movable toward and from the openings and arranged to have sealing engagement with the container around said openings, means for simultaneously moving said jaws to cause such engagement, and automatic means for simultaneously admitting air

under pressure through both the jaws to said container when the sealing engagement is substantially completed.

5. A machine for testing a container which has an opening therein, said machine comprising a hollow jaw, means for causing relative movement between the container and the jaw to establish a sealing engagement around the wall of the opening and for thereafter admitting compressed air to the container, a tank for liquid in which the container is arranged to be immersed while being tested, means for shutting off the supply of air at the end of the test and for thereupon automatically allowing the air to escape from the container, and means for causing a relative movement between the container and the jaw to break the sealing engagement when the pressure in the container has been materially reduced.

6. A machine for testing containers having spaced openings therein, said machine comprising a pair of spaced clamp jaws movable toward and from the openings and arranged to have sealing engagement with the container around said openings, hollow piston rods to which said jaws are respectively attached, cylinders in which said piston rods slide, a single valve for admitting air under pressure to said cylinders to cause the jaws to engage the container, and automatic valve means for thereafter admitting air to the container through the piston rods.

7. A machine for testing a container which has an opening therein, said machine comprising a hollow sealing member and pneumatic means for forcing said member into sealing engagement with the container around said opening, and a valve stem projecting into said hollow member, said stem having a passage therein arranged to be uncovered as the member approaches the end of its movement toward the container, whereby air under pressure is automatically admitted to the container.

8. A machine for testing containers having spaced openings therein, said machine comprising a pair of spaced sealing members movable toward and from the openings and arranged to have sealing engagement with the container around said openings, threaded means for adjusting one of the sealing members in respect to the other to correspond to different distances between the openings, means for simultaneously moving said sealing members into sealing engagement with the container, and means for ad-

mitting air under pressure to said container through one of said sealing members.

9. A testing machine comprising a hollow frame, said frame forming a guide, a post movable up and down in the guide, a shallow tank carried on the upper end of the post and adapted to contain liquid, a counterweight for the post and tank within the opening in the frame, and means for admitting air to a container immersed in said liquid.

10. A machine for testing a container having spaced openings therein, said machine comprising clamp means for holding said container and for sealing the openings therein and for admitting air thereto under pressure, a tank having an open top, means for causing the tank to approach the clamp means to immerse the container in liquid contained in said tank, and counterbalancing means for the tank.

11. A testing machine comprising a frame having a guide, a post reciprocable up and down therein, a treadle for reciprocating the post, a head secured to the upper end of the post and extending transversely therefrom on each side, a shallow tank mounted on the head, and a pair of spaced relatively fixed pneumatic clamps disposed a short distance above the tank in position to depend therein when the post is in elevated position.

12. A machine for testing a container which has an opening therein, said machine comprising a hollow sealing member and pneumatic means for forcing said member into sealing engagement with the container around said opening, and a detachable valve stem projecting into said hollow member constructed and arranged to admit air to the opening in the hollow member as the latter approaches the limit of its movement toward the container, whereby air under pressure is automatically admitted to the container.

13. A machine for testing a container having a pair of alined openings therein, said machine comprising a pair of jaws, one of which is movable toward the other, one of the jaws having a portion adapted to project through the corresponding opening into the container, said jaw also having an annular in-turned rib spaced from and concentric with said portion and detachable therefrom, and a gasket in the groove between the portion and the rib, said rib overlapping the gasket and holding it in position.

FRANK J. SINGER.