

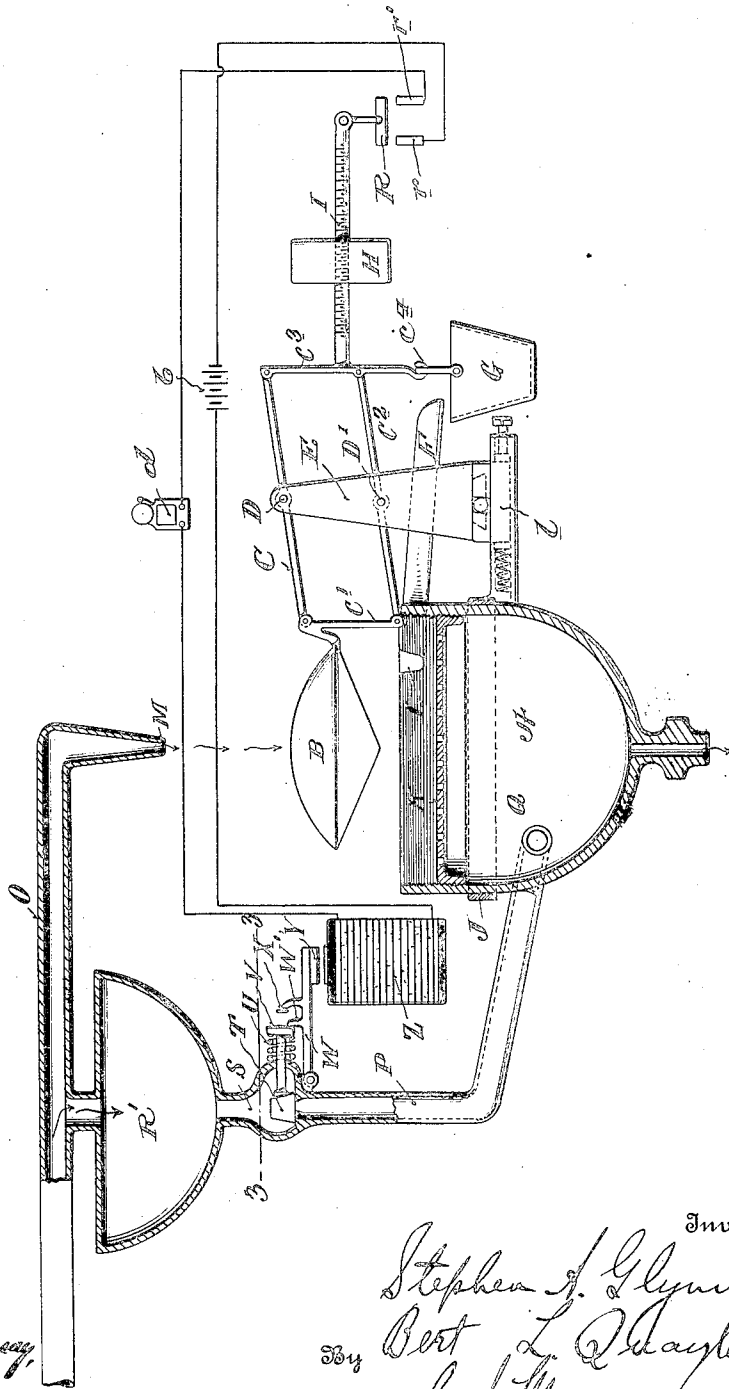
S. A. GLYNN & B. L. QUAYLE.
LIQUID CONTROLLED ALARM APPARATUS.
APPLICATION FILED FEB. 21, 1912.

1,104,419.

Patented July 21, 1914.

2 SHEETS—SHEET 1.

Fig. 1.



Witnesses
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2 SHEETS-SHEET 2.

Fig. 2.

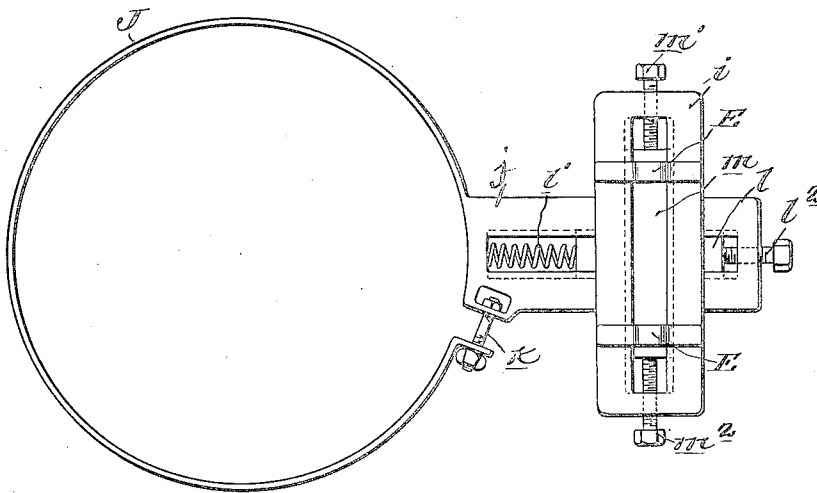


Fig. 4.

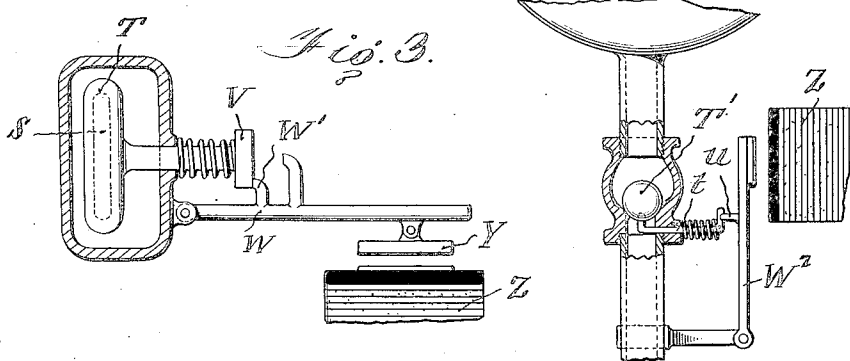


Fig. 3.

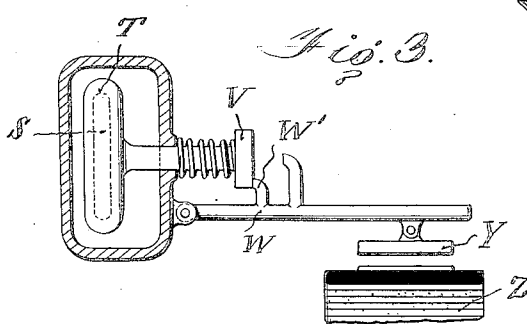
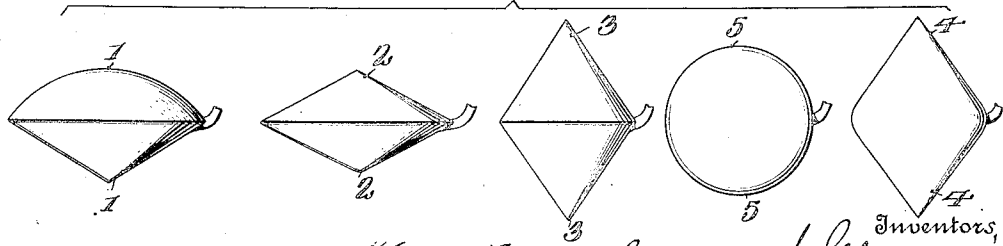


Fig. 5.

Witnesses

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UNITED STATES PATENT OFFICE.

STEPHEN A. GLYNN AND BERT L. QUAYLE, OF EAST ELY, NEVADA.

LIQUID-CONTROLLED ALARM APPARATUS.

1,104,419.

Specification of Letters Patent.

Patented July 21, 1914.

Application filed February 21, 1912. Serial No. 679,200.

To all whom it may concern:

Be it known that we, STEPHEN A. GLYNN and BERT L. QUAYLE, citizens of the United States, residing at East Ely, in the county of White Pine and State of Nevada, have invented certain new and useful Improvements in Liquid-Controlled Alarm Apparatus, of which the following is a specification.

This invention relates to certain improvements in safety or warning apparatus and controlling means therefor, for insuring a constant liquid flow from a jet or orifice, and for sounding an audible alarm upon the diminution, or cessation of such flow.

One of the objects of the invention is to provide an apparatus, which is automatic in its action, and is constructed and arranged for operation upon the diminution, or cessation, of the flow of a liquid to sound an alarm and thereby warn an attendant of such cessation or diminution of flow. In this connection, the apparatus, which is of special utility in connection with a lubricating system, embodies as an element a suitable straining device which is located in the path of the flowing liquid as it issues from the aforesaid jet or orifice. Preferably, means additional to that above referred to for sounding an alarm upon the cessation, or diminution of the flow, is provided whereby if the straining device becomes foul or stopped up, so as to impede the passage of the liquid therethrough, through a suitable overflow the alarm apparatus will be actuated to indicate a cessation of the flow of the liquid from this last-named cause.

In addition to the features above recited, the invention also includes, as an important feature, a secondary conduit or passage, which may contain a chamber for a reserve supply of the lubricant, and a valve in said conduit which normally is closed against the passage of liquid. This valve is so constructed and arranged for operation that if the liquid should cease to flow through the main passage, or the strainer heretofore referred to should become foul so as to prevent the passage of liquid therethrough, it will, through suitable electrical or other means, be permitted to operate in such manner as to open the secondary passage and permit the flow of the lubricant, or other liquid to continue therethrough.

Other features of the invention, including very important details of construction, and combinations of parts, will be hereinafter

more particularly described and the novel features thereof pointed out in the claims.

In the accompanying drawings, Figure 1 represents a side elevation, partly in vertical longitudinal section, of an apparatus embodying the present invention; Fig. 2 is a plan view, on a larger scale than Fig. 1, illustrating certain details to be described later. Fig. 3 is a horizontal section on the line 3—3 of Fig. 1, showing a slight rearrangement of the magnet and valve operating arm for the secondary passage; Fig. 4 is a side elevation, partly sectional, showing a modification; and Fig. 5 is a view showing several alternative forms of the counter-balance controlling tongue.

Referring to Fig. 1, A represents a cup for containing oil, or other liquid, which is supplied from the main pipe O, to a discharge nozzle M from which it issues in a stream, or in drops, according to the requirements of the particular case. The cup A is shown herein as provided near its upper portion with an internal screw thread, and a sediment arresting screen or strainer K is provided peripherally with an external thread whereby it may be connected to the cup A in such manner as to strain the oil flowing therethrough from the pipe O. A clamping band J, which is best shown in Fig. 2, is at one end connected or formed integral with a base j, and its opposite end is shown as bent laterally, a bolt $\frac{1}{2}$ passing through a perforation in the base j, and also through a perforation in the bent end of the band J, and provided with suitable nuts at its ends, said parts forming a clamp. The band J, as shown in Fig. 1, is firmly clamped around the oil cup A, and the base j carries a slide l which moves in ways in said base. A spring l' acts upon one end of the slide l, and a screw l², which has threaded engagement with the forward portion of the base j, acts upon the opposite end of said slide. The slide l supports a base i carrying ways arranged at right angles to the slide l and in which ways is slidably mounted a second slide m which is adjustably held in position by set screws m' and m². Standards E are supported from the slide m, levers C, C² are pivoted from rods D, D' carried by the standards, said levers having their ends pivoted to rods C' and C³, so as to form a parallelogram. The several members C, C', C² and C³ of the parallelogram may be connected at their respective ends by cone piv-

ots, or other pivoting or hinging devices. The member C' of the parallelogram is provided with a rigid, horizontally projecting tongue B which is so shaped and arranged
 5 as to receive the oil as it issues from the nozzle M in its passage to the cup A. The member C^3 of the parallelogram has a downwardly extending portion which is shown as terminating in a hook C^4 from which is suspended a bucket or other form of receptacle
 10 G. The upper portion of the cup A is shown as having a notch L therein, from which leads an overflow conductor F, discharging into the receptacle G. It will be observed that by the use of the parallelogram the members C' and C^3 will always be maintained in a vertical position whatever the position of the balance may be. Fixed to the member C^3 of the parallelogram is a
 20 threaded spindle I carrying a threaded counter-weight H, which latter is thereby rendered adjustable. The rod I also carries at its outer end a circuit closer R, which is normally maintained out of engagement with the terminals r, r' of a circuit which includes a battery b and an alarm d , as shown in Fig. 1.

With the apparatus as thus far described it will be observed that the tongue B is supported in position beneath the nozzle M, and the adjustment afforded by the slides l and m renders it possible to locate the center of the tongue in vertical alinement with the center of the nozzle M. These conditions
 30 being properly adjusted the flow of oil from the nozzle, either in the form of drops or a stream, will effect, upon proper adjustment of the weight H an overbalancing of the end of the levers C, C^2 to which said weight is connected, and will thereby hold the circuit closer R in the position shown in Fig. 1, and so that the circuit will be open and the alarm d will not operate. In the event, however, of the flow from the nozzle M being arrested,
 45 or so diminished that the amount of oil retained temporarily upon the tongue B is insufficient to overbalance the weight H, said weight will cause the circuit closer to complete the circuit through the battery and alarm d , and advise the attendant of such stoppage or diminution of the flow of oil. It will also be seen that in case the screen K should become clogged by sediment, or otherwise so rendered inactive as to cause the oil
 55 to back up and flow through the opening L and overflow F into bucket G, the tongue B will also be overbalanced, and the circuit closed to sound the alarm and warn the attendant. The apparatus therefore is so constructed that upon failure of the oil to pass freely beyond the vessel A to the bearing or other point of supply, either by reason of a stoppage in the supply pipe O, or nozzle M, or by reason of the screen K being
 65 clogged, an alarm will be sounded.

In addition to the means for actuating the alarm provision is also made under this invention to automatically continue the oil flow in case of the cessation of the flow from the main orifice M, or in case of the clogging of the screen K in the oil cup A.
 70 This addition comprises an auxiliary oil passage P, which connects the pipe O with the vessel A, below the screen K, the passage P having therein preferably an auxiliary reservoir R' for the oil. A valve T, shown in Fig. 1 as a slide valve, and having a stem moving in an aperture through a casing in the pipe M, and provided with a head V, and a spiral spring U which is confined between the valve casing and head V, is normally held closed by suitable means, as will be described. As shown in Fig. 1 a pivot lever W carries a finger W' , which is engaged by the head V of the valve under the stress of the spring U, and holds the valve normally closed across the passage P. An electro-magnet Z is included in the circuit before referred to, and shown in Fig. 1, and an armature Y is carried by the outer end of the lever W, and said lever also carries a stop finger X which is in position to arrest the outward movement of the valve when the same is released and permitted to open.
 95 With this construction, it will be seen that when the circuit is closed, either by cessation of the flow from the nozzle M, or by a clogging of the screen K, the magnet Z, being energized, will attract the armature, thus removing the finger W' from the head V, and permitting the spring U to open the valve T. This will permit oil to flow from the auxiliary reservoir through the pipe P into the vessel A below the screen K, and thence to the bearing or other point of delivery.
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Instead of a slide valve T, as shown in Fig. 1 of the drawings, the valve of the auxiliary supply pipe may be in the form of a ball valve T' , as shown in Fig. 4. In this view the valve is actuated by a small rod t , which is rotatably mounted in the valve casing, and has at its inner end a bent portion or foot to engage the valve, and at its outer end a bent portion to engage a projection u carried by the lever W^2 . A torsion spring, having one end connected with the rod t , and its other end connected with the valve casing, normally tends to rotate the rod in a direction to open the valve, but is prevented by the finger u when the lever W^2 occupies the position shown in Fig. 4. When the magnet Z is energized, the armature, being attracted, will move lever W^2 to the right, releasing the rod t , and thereby permitting the torsion spring to rotate said rod and lift the ball valve from its seat.
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In Fig. 5 are represented several modified forms of the tongue B whose shape will be determined by the character of the flow of
 130

oil through the discharge nozzle, and by other conditions. It will be observed that the device, although requiring a certain amount of delicacy of adjustment, is applicable, by slight changes of the form of the tongue, to controlling the alarm in the case of a drop feed, as well as a stream flow of lubricant, although in the former case more careful designing of the tongue B is required. To further elucidate this feature of the device, it is to be observed that the central idea is a counter-balancing of, first, the weight of the oil on the tongue at any instant of time during its travel from the highest, to the lowest point on the tongue, and second, the momentum of the oil impinging upon the tongue. When, therefore, the flow of oil from the feed pipe is lessened to a series of drops, both the weight of oil on the tongue and the momentum of the oil impinging upon the tongue is reduced, resulting in the necessity of a very fine adjustment of the counter-weight, and necessitating perhaps a modification of the form of the tongue itself. Referring to Fig. 5, for instance, the tongue 3, 3, shown therein (or its modified form as shown at 4, 4) might very well serve in connection with a solid stream feed, but in order to make the device effective with a drop feed the cones 3, 3, would probably have to be flattened, as shown for example, at 2, 2, so as to reduce the speed of the oil in flowing from the top to the bottom of the tongue. Assuming for example that the proper lubrication of a journal required one drop from the feed nozzle M per second, it might be desirable to so flatten the cones 3, 3, as to require say, one minute for a drop of oil to run from the point of impact of the stream to the lowest point on the tongue. The weight of oil on the tongue, at any instant of time, therefore, when the lubricator is feeding properly, would be the weight of sixty drops of oil. If then the feed pipe should become clogged so as to reduce this supply to thirty drops per minute, the counter-weight would detect the difference in the weight of oil on the tongue, and register through the electric signal, a call for attention.

The right is reserved to vary the structural details of the apparatus, herein disclosed by way of example only, within certain limits, and the invention is not confined to the exact construction and arrangement shown, other than the same is limited by the terms of the following claims.

It is characteristic of the several forms of tongue illustrated that they comprise protuberant surfaces, the upper portion or surface being shaped to receive the drops or stream of oil issuing from the nozzle M, while the lower portion retains, for a time, the oil until it finally is discharged from the lowest point thereon. In Figs. 1 and 5, a

desirable form of tongue comprises an upper convex portion and a lower conical portion. Other forms are also illustrated in Fig. 5, and the invention is not confined to any particular design of tongue as the same may be varied to suit the different conditions of liquid flow from the orifice M.

Having thus described our invention, what we claim as new and desire to secure by Letters Patent of the United States is:

1. In an apparatus of the class described, means for supplying liquid, a receptacle for the liquid, a counterbalanced lever carrying a tongue having oppositely projecting surfaces shaped to retain a portion of the liquid flowing from the source of supply to said receptacle, said tongue being located between said liquid supply and receptacle, and means controlled by the lever to indicate a diminution of the flow of the liquid.

2. In an apparatus of the class described, a liquid supplying conduit provided with a discharge orifice, a counterbalanced lever carrying at one end a tongue comprising protuberant surfaces which project above and below a central horizontal plane and upon which a portion of the liquid is adapted to be retained by adhesion, said tongue being located below said orifice, and an alarm arranged for operation by said lever when the weight of liquid on the tongue falls below a predetermined limit.

3. In an apparatus of the class described, the combination of a supply pipe, a counterbalanced lever carrying a tongue comprising protuberant surfaces projecting above and below a central horizontal plane and arranged in the path of the liquid flowing from said pipe, a circuit-closer carried by said lever, and a circuit having an alarm therein and also having terminals in position to be closed by the circuit-closer when said tongue is overbalanced.

4. In an apparatus of the class described, the combination of a supply pipe, a receptacle to contain liquid flowing from said pipe, a pivoted lever carrying at one end a tongue comprising surfaces which project above and below a central horizontal plane and are adapted to retain a portion of the liquid thereon, said tongue being arranged to receive the liquid discharged from said pipe, an adjustable weight supported from the other end of said lever, and an alarm arranged for actuation by said lever when the tongue becomes overbalanced by said weight.

5. In an apparatus of the class described, the combination of a supply pipe, a receptacle to receive liquid from said pipe, levers pivotally supported in parallel relation, rods pivoted to the ends of said levers to form a parallelogram, a tongue supported from one end of the levers in position to receive liquid flowing from said pipe, an adjustable weight supported from the other

end of said levers, and an alarm arranged for actuation by said levers when the supply of liquid diminishes sufficiently to permit overbalancing of the tongue by the weight.

5. 6. An apparatus of the class described having, in combination, a supply pipe, pivoted levers arranged in parallel relation, rods pivoted to the ends of said levers and forming therewith a parallelogram, a tongue supported from one end of the levers in position to receive the liquid discharged from said pipe, an adjustable weight carried by the other end of said levers, and an alarm arranged to be actuated by movement of the levers when the supply of liquid diminishes sufficiently to permit overbalancing of the tongue by the weight.

7. An apparatus of the class described having, in combination, a supply pipe, pivoted levers arranged in parallel relation, rods pivoted to the ends of said levers and forming therewith a parallelogram, a tongue comprising protuberant surfaces and supported from one end of the levers in position to receive the liquid discharged from said pipe, an adjustable weight carried by the other end of said levers, and an alarm arranged to be actuated by movement of the levers when the supply of liquid diminishes sufficiently to permit overbalancing of the tongue by the weight.

8. An apparatus of the class described having, in combination, a supply pipe having a discharge orifice, a pivoted lever having at one end a tongue comprising upper and lower protuberant surfaces for retaining a portion of the liquid thereon and located in the path of the liquid flowing from said pipe, and at the other end carrying an adjustable weight, an alarm arranged for actuation by said lever when the flow of liquid diminishes sufficiently to permit the weight to overbalance the tongue, and means permitting adjustment of said tongue whereby its center may be located in alignment with said orifice.

9. An apparatus of the class described having, in combination, a supply pipe provided with a discharge orifice, a support, a lever pivoted to said support and having at one end a tongue comprising upper and lower protuberant surfaces which are adapted to retain a portion of the liquid thereon by adhesion and at its opposite end an adjustable weight, an alarm arranged to be actuated by said lever upon diminution of the flow through said pipe, and slides sustaining said support and arranged for adjustment in transverse planes to center the tongue relatively to said orifice.

10. An apparatus of the class described having, in combination, a supply pipe provided with a discharge orifice, a receptacle below said orifice, a clamp surrounding said receptacle, holding means for the clamp, a

base sustained from said clamp, transversely movable slides carried by said base, adjusting means for said slides, a standard supported from the slides, a lever fulcrumed to said standard, a tongue carried by one end of the lever and comprising upper and lower protuberant surfaces which are adapted to retain a portion of the liquid thereon by adhesion, said tongue arranged in the path of the liquid flowing from the orifice, an adjustable weight supported from the other end of said lever, and an alarm arranged to be actuated by said lever when said weight overbalances said tongue.

11. An apparatus of the class described having, in combination, a supply pipe provided with a discharge orifice, a lever pivotally supported and carrying at one end a tongue composed of oppositely disposed protuberant surfaces adapted to retain a portion of the flowing liquid thereon by adhesion, said tongue arranged in the path of the liquid flowing from said orifice, an adjustable weight carried by the other end of said lever, and an alarm arranged to be actuated by the lever when through a diminution or cessation of the normal flow of liquid through the supply pipe, the tongue will be relieved of a sufficient amount of liquid to permit said weight to overbalance said tongue.

12. An apparatus of the class described having, in combination, a supply pipe provided with a discharge orifice, a pivotally supported lever carrying at one end a tongue composed of an upper convex surface, and a lower conical surface constructed to retain a portion of the flowing liquid thereon by adhesion, said tongue being interposed in the path of the liquid flowing from said orifice, an adjustable weight carried by the other end of said lever, and an alarm arranged to be actuated by the lever when through a diminution or cessation of the normal flow of liquid through the supply pipe the tongue will be relieved of a sufficient amount of liquid to permit said weight to overbalance said tongue.

13. An apparatus of the class described having, in combination, a supply pipe provided with a discharge orifice, a liquid receptacle arranged below said orifice and provided with a strainer, a counterbalanced lever having at one end a tongue which is located in the path of the liquid flowing from said orifice to the receptacle, a vessel supported from the other end of said lever, an overflow opening in the receptacle above the strainer, means for conducting liquid from said opening to said vessel, and an alarm arranged for actuation by said lever when the lever is overbalanced by the liquid in said vessel.

14. An apparatus of the class described having, in combination, a supply pipe, a re-

ceptacle arranged to receive liquid discharged from said pipe, a strainer in said receptacle, an overflow for conducting the liquid from a point above said strainer, a
 5 pivoted lever carrying at one end a tongue interposed in the path of liquid flowing from said pipe, an adjustable weight supported from the other end of said lever, a vessel
 10 also supported from the same end of the lever and arranged to receive the liquid which overflows from said receptacle when the strainer becomes clogged, and an alarm to be actuated by said lever upon the overflow of liquid.

15 15. An apparatus of the class described having, in combination, a supply pipe, a receptacle arranged to receive liquid discharged from said pipe, a strainer having threaded engagement with the interior of
 20 said receptacle, an opening in the walls of the receptacle above said strainer and an overflow conduit communicating with said opening, a pivoted lever carrying at one end a tongue arranged in the path of the liquid
 25 flowing from said pipe, and at the other end supporting an adjustable weight, a vessel sustained from the latter end of said lever in position to receive the overflow from said
 30 receptacle, an electrical circuit having an alarm and suitable terminals, and a circuit closer supported by said lever and arranged to complete the circuit and sound the alarm when the tongue is overbalanced by the liquid in the overflow vessel.

35 16. An apparatus of the class described having, in combination, a supply pipe with a discharge orifice therein, a receptacle to receive liquid flowing from said orifice and having a discharge connection, an alarm, an
 40 auxiliary pipe or conduit connecting the main supply pipe with said receptacle, a normally closed valve in said auxiliary supply, and means arranged for actuation automatically when the supply through said orifice
 45 is diminished or stopped to sound the alarm, and also to permit flow from the supply pipe to the discharge connection.

50 17. An apparatus of the class described, a main supply pipe provided with a discharge orifice, a receptacle below said orifice, a liquid strainer in said receptacle, an electric circuit including an alarm, means to effect actuation of the alarm when said
 55 strainer becomes clogged, an auxiliary supply pipe connecting the main supply pipe with the receptacle at a point below the strainer, a normally closed valve in the auxiliary supply pipe, and means for opening said valve when the alarm is actuated.

60 18. An apparatus of the class described having, in combination, a main supply pipe provided with a discharge orifice, a receptacle below said orifice, an electrical circuit having an alarm therein, mechanism arranged for actuation when the flow through
 65 said orifice diminishes or stops to actuate the alarm, an auxiliary supply pipe connecting the main supply pipe with the receptacle, a normally closed valve therein, and means whereby said valve is opened to establish communication between said main supply pipe and receptacle when the alarm is actuated.

70 19. An apparatus of the class described having, in combination, a main supply pipe provided with a discharge orifice, a receptacle below said orifice, a normally open electric circuit, an alarm in said circuit, means controlled by a change in the flow of liquid from said orifice to close the circuit and
 75 actuate the alarm, an auxiliary pipe connecting said main supply pipe with the receptacle, a normally closed valve in said auxiliary pipe, means tending to open said valve, a detent lever carrying an armature
 80 and constructed to maintain said valve closed, and a magnet included in said circuit to be energized when the alarm is sounded thereby attracting said armature and permitting the valve in the auxiliary pipe to
 85 open.

90 20. An apparatus of the class described having, in combination, a main supply pipe provided with a discharge orifice, a receptacle below said orifice, an auxiliary supply
 95 pipe connecting the main supply pipe with the receptacle, an electrically-controlled slide valve in said auxiliary supply pipe and normally closing the same, an electrical circuit having an alarm therein, and circuit closing
 100 means arranged for actuation upon the diminution or cessation of flow through said orifice to sound the alarm and open the valve in the auxiliary supply pipe.

105 21. An apparatus of the class described having, in combination, a supply pipe provided with a discharge orifice, a receptacle below said orifice having a strainer therein, an electrical circuit provided with an alarm, an auxiliary supply pipe connecting the
 110 main supply pipe with the receptacle below said strainer, a normally closed valve in said auxiliary supply pipe, and mechanism arranged to be actuated when said strainer becomes clogged to sound the alarm and open
 115 the valve in the auxiliary supply pipe.

120 22. An apparatus of the class described having, in combination, a supply pipe provided with a discharge orifice, a receptacle below said orifice having a strainer therein, an electrical circuit provided with an alarm, an auxiliary supply pipe connecting said main supply pipe with the receptacle below the strainer, a normally closed valve in the auxiliary supply pipe, a reservoir in said
 125 pipe, and mechanism controlled by a change of flow through said orifice or by the clogging of the strainer for actuating the alarm and for opening said valve.

23. An apparatus of the class described 130

having, in combination, a main supply pipe provided with a discharge orifice, a receptacle below said orifice, a strainer in said receptacle, a normally open electrical circuit provided with an alarm, an auxiliary supply pipe connecting the main supply pipe with the receptacle below the strainer, a normally closed electrically-controlled valve in the auxiliary supply pipe, and circuit closing means arranged for actuation upon the diminution or cessation of flow through said orifice to sound the alarm and open said valve.

24. An apparatus of the class described having, in combination, a main supply pipe provided with a discharge orifice, a receptacle below said orifice, an auxiliary supply pipe connecting the main supply pipe with the receptacle, a valve in the auxiliary supply pipe having a stem provided with a head,

a spring arranged between the valve casing and said head, a pivoted lever having a finger to engage said head and hold the valve closed, an armature carried by said lever, an electrical circuit provided with an alarm and a magnet, and means actuated by a change of flow through said orifice to close the circuit thereby sounding the alarm and energizing said magnet to attract the armature and permit said valve to be opened by its spring.

In testimony whereof we affix our signatures in presence of two witnesses.

STEPHEN A. GLYNN.
BERT L. QUAYLE.

Witnesses:

CHARLES S. CHANDLER,
B. T. JUSTESEN.