

R. H. ALDRICH.
SAFETY DEVICE FOR ACCUMULATORS.
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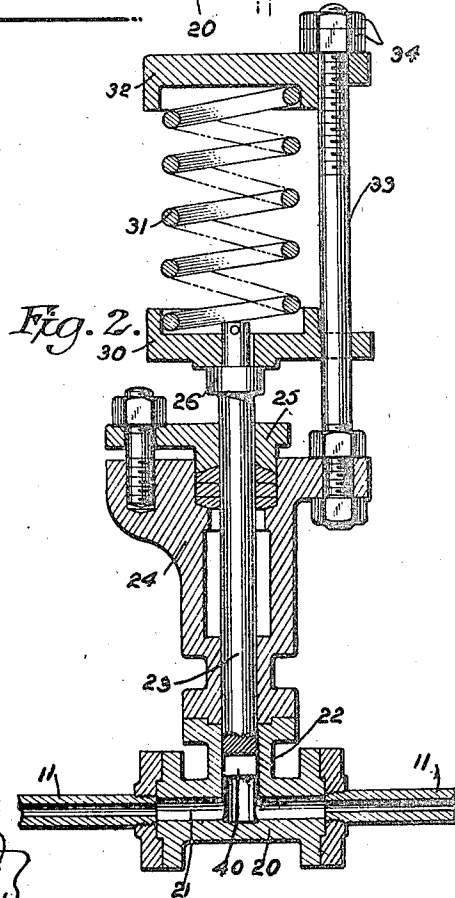
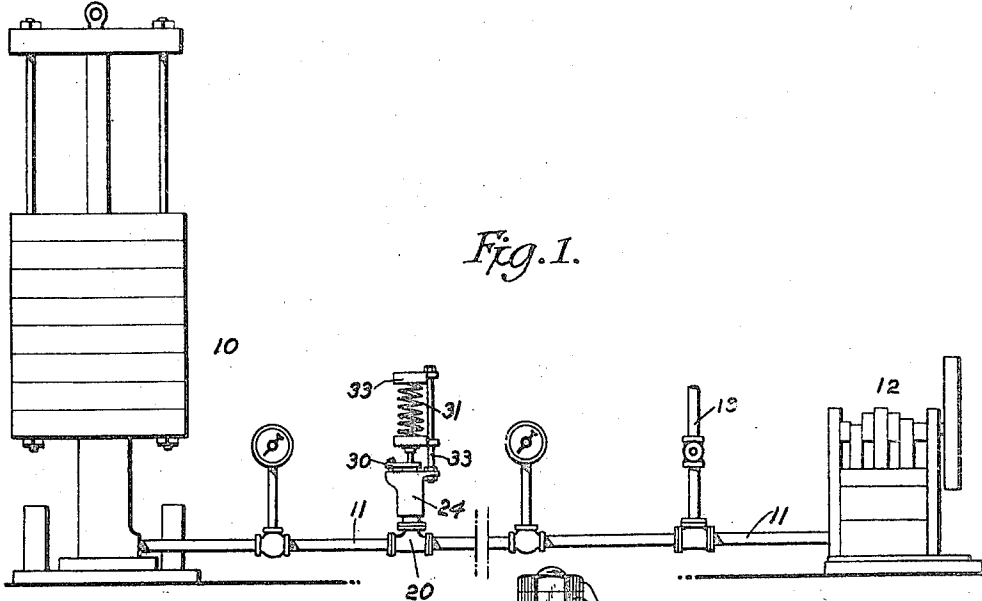
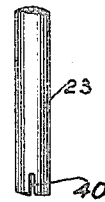


Fig. 3.



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SAFETY DEVICE FOR ACCUMULATORS.

1,320,306.

Specification of Letters Patent.

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To all whom it may concern:

Be it known that I, ROSCOE H. ALDRICH, a citizen of the United States, and a resident of Allentown, in the county of Lehigh and State of Pennsylvania, have invented a new and Improved Safety Device for Accumulators, of which the following is a full, clear, and exact description.

The invention relates to hydraulic accumulators and its object is to provide a new and improved safety device for such accumulators arranged to relieve the pressure supply pipe from undue strain incident to the fluctuation in the pressure, and, in case the supply pipe should break or become leaky, to close the same and thereby prevent the accumulator from dropping. Another object is to permit adjustment of the safety device while the accumulator is in service. Another object is to permit of minute adjustment of the safety device to render the same exceedingly sensitive in its action.

With these and other objects in view, the invention consists of certain novel features of construction as hereinafter shown and described and then specifically pointed out in the claims.

A practical embodiment of the invention is represented in the accompanying drawings forming a part of this specification, in which similar characters of reference indicate corresponding parts in all the views.

Figure 1 is a side elevation of the safety device as applied;

Fig. 2 is an enlarged sectional side elevation of the safety device; and

Fig. 3 is an elevation of the lower end of the plunger.

The accumulator 10 of usual construction is connected by the supply pipe 11 with the pump 12 or other means for supplying the accumulator with water under pressure. The supply pipe 11 is provided with the usual pipe 13 leading to the press or other machine to be controlled. In the supply pipe 11 adjacent the accumulator 10 is arranged a casing 20 provided with a passage 21 for the flow of the water through the pipe 11. Into this passage 21 leads a cylinder 22 formed in the casing 20 and extending upwardly. In the cylinder 22 is mounted to slide up and down a plunger 23 extending upward through a bonnet 24 forming part of the casing 20 and having a stuffing box 25 through which extends the upper end

of the plunger 23 to the outside. On the upper outer end of the plunger 23 is formed or secured a collar 26 on which rests a spring seat 30 engaged by the lower end of a spring 31 engaging with its upper end a spring cap 32 held vertically adjustable on a screw rod 33 attached at its lower end to the bonnet 24. On the upper end of the screw rod 33 screws a nut 34 against the top of the spring cap 32 to permit of regulating the tension of the spring 31. The lower end of the plunger 23 is provided with a minute opening or slot 40 to permit a small amount of water to flow through the passage 21 at the time the plunger 23 is in lowermost closed position relative to the passage 21.

The operation is as follows:

When the pump 12 and the accumulator 10 are working then the plunger 23 is held in uppermost position by the pressure of the water passing unobstructedly through the supply pipe 11 and the passage 21 of the casing 20. In case the pipe 11 breaks or becomes defective intermediate the safety device and the pump 12 then the pressure in the pipe 11 drops and in doing so the upward pressure on the plunger 23 is reduced and the plunger is forced downward into closed position by the action of the spring 31. By this arrangement the accumulator 10 is prevented from dropping suddenly thus preventing injury to the accumulator.

From the foregoing it will be seen that normally the plunger 23 is in raised inactive position but as soon as a break occurs in the pipe line from either a fitting, defective valve or any other means that will allow the pressure in the pipe line to drop then the pressure device connected with the plunger 23 moves the latter into closed position thereby preventing the accumulator 10 from descending too rapidly.

It is understood that the small opening 40 allows sufficient passage of the water to permit the accumulator 10 to drop with safety.

Having thus described my invention, I claim as new and desire to secure by Letters Patent:

1. In combination with a hydraulic accumulator provided with a supply pipe, a casing in the said supply pipe and having a passage for the water and having a cylinder intersecting the passage, a plunger slidable in the said cylinder and adapted to

close the said passage, the said plunger extending through the casing at the outside thereof, and a pressure device connected with the outer end of the said plunger to
5 move the latter into closed position relative to the said passage on a reduction of the pressure in the supply pipe below that to which the said pressure device is set.

2. In combination with a hydraulic accumulator provided with a supply pipe, a
10 casing in the said supply pipe and having a passage for the water and having a cylinder intersecting the passage, a plunger slidable in the said cylinder and adapted to
15 close the said passage, the said plunger extending through the casing to the outside thereof, the inner end of the said plunger having a small opening to maintain communication by way of the opening and pas-
20 sage with the supply pipe on the closing of the plunger, and a pressure device connected with the outer end of the said plunger to

move the latter into closed position relative to the said passage on a reduction of the pressure in the supply pipe below that to
25 which the said pressure device is set.

3. In combination with a hydraulic accumulator provided with a supply pipe, a casing in the said supply pipe and having
30 a passage for the water and having a cylinder intersecting the passage, a plunger slidable in the said cylinder and adapted to close the said passage, the said plunger extending through the casing to the outside
35 thereof, a spring, a spring seat held on the outer end of the plunger and on which the said spring is seated, a spring cap engaged by the upper end of the said spring, and a
40 rod mounted on the said casing and on which the said spring cap is adjustably mounted to permit of regulating the tension of the said spring.

ROSCOE H. ALDRICH.