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Pestunov

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(54) **SELF-KILLING OF SHOCK PULSES OF TRANSFERRED MEDIUM IN MAIN PIPELINE**

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(58) **Field of Classification Search**

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(56) **References Cited**

U.S. PATENT DOCUMENTS

2,678,066 A * 5/1954 Coolidge G05D 7/0133

138/45

3,744,527 A * 7/1973 Mercier F15B 1/16

138/30

(Continued)

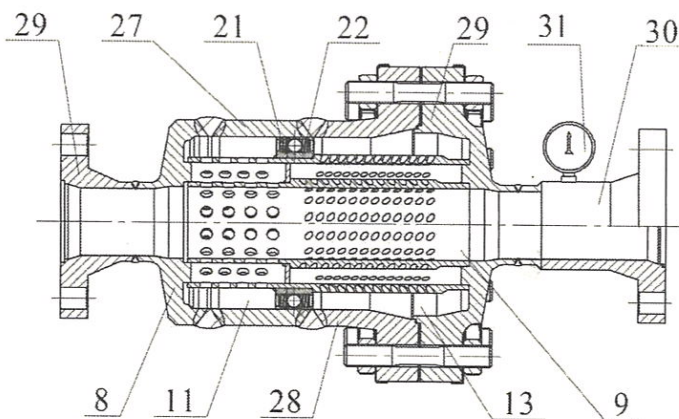
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(57) **ABSTRACT**

The invention relates to the field of physics—namely, to control systems and the pressure control of liquids and gases, in particular—to stabilizing devices operating at overloads, including hydraulic shocks. Technical result from use of the claimed invention is simplicity of the manufacturing process and assembly, easiness of operation and efficiency of quenching pulses. A method consists of the fact that at the section of said pipeline installed at least one pressure pulse stabilizer in the direction of movement of transferred medium from supplier to consumer. Pulse flow is directed as a first portion into the stabilizer, and after its first portion a second portion of the flow is directed, which after a delay is sent into additional input of the stabilizer. The potential sources of pressure pulses are preliminary revealed on the protected section of the pipeline. Then the place of installation of the stabilizer is defined based on condition—at a distance no further than 10 meters from the potential point source of pressure pulses and on condition—at a distance 100-1000 meters during preventive installation on the road, at least two stabilizers on the stage. Stabilizers are oriented on the pointer on its outer surface toward the potential point source of the pressure pulses and the arrows pointed in the same direction as the direction of flow of the transferred medium at the stages. Stabilizers have straight flow chamber for at least 1/3 less than largest vortex chamber, between the casing and shell—pressurized chamber connected via radial openings with straight flow chamber and the equalizing chamber, which connected via inclined holes with the vortex chamber. The diameter of the radial openings is 1.2-4 of the diameter of inclined holes. The angles α and

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β of inclined holes—in the range 0-45°. Pressure in the pressure and in the levering chambers is equalized by shifting the pistons by the springs to the original position. Different options are offered for killing of pressure pulse by different means, associated with variations in the design of elements of the stabilizer.

4 Claims, 4 Drawing Sheets

(58) Field of Classification Search

USPC 138/30, 31
See application file for complete search history.

(56) References Cited

U.S. PATENT DOCUMENTS

4,497,388 A * 2/1985 Dexter F16L 55/053
138/30
4,759,387 A * 7/1988 Arendt F15B 1/16
138/30
5,735,313 A * 4/1998 Jensi, Jr. F04B 11/0016
138/26
5,740,837 A * 4/1998 Chiang G05D 16/0602
138/31
5,860,452 A * 1/1999 Ellis F16L 55/054
138/26
6,264,069 B1 * 7/2001 Hughes B67D 1/08
138/30

* cited by examiner