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REMOTE CONTROL MEANS FOR SHUT-OFF VALVE

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Fig. 1

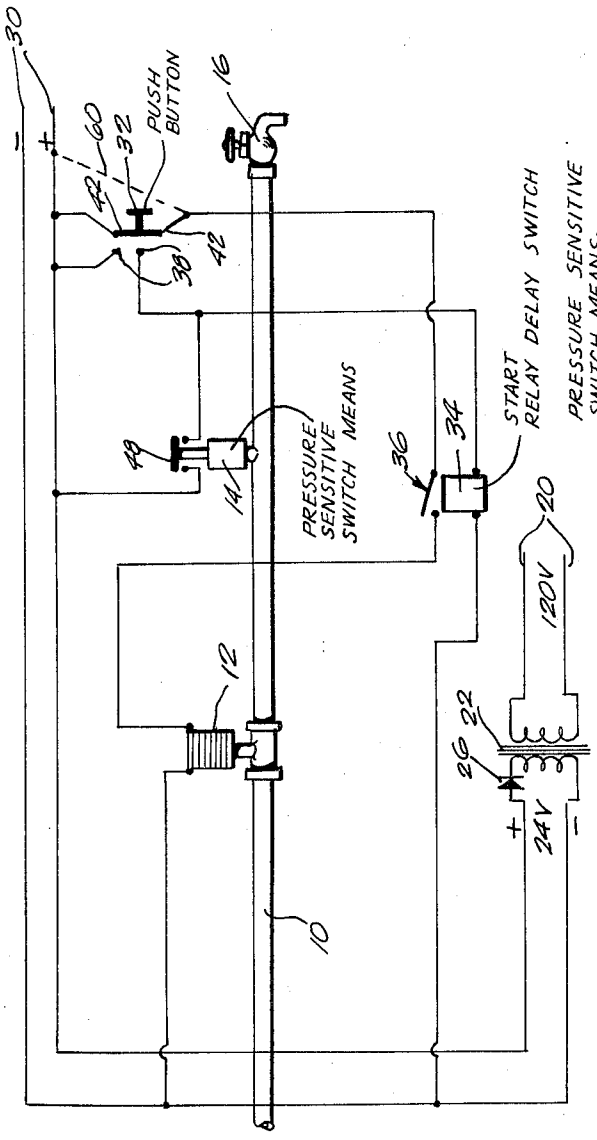
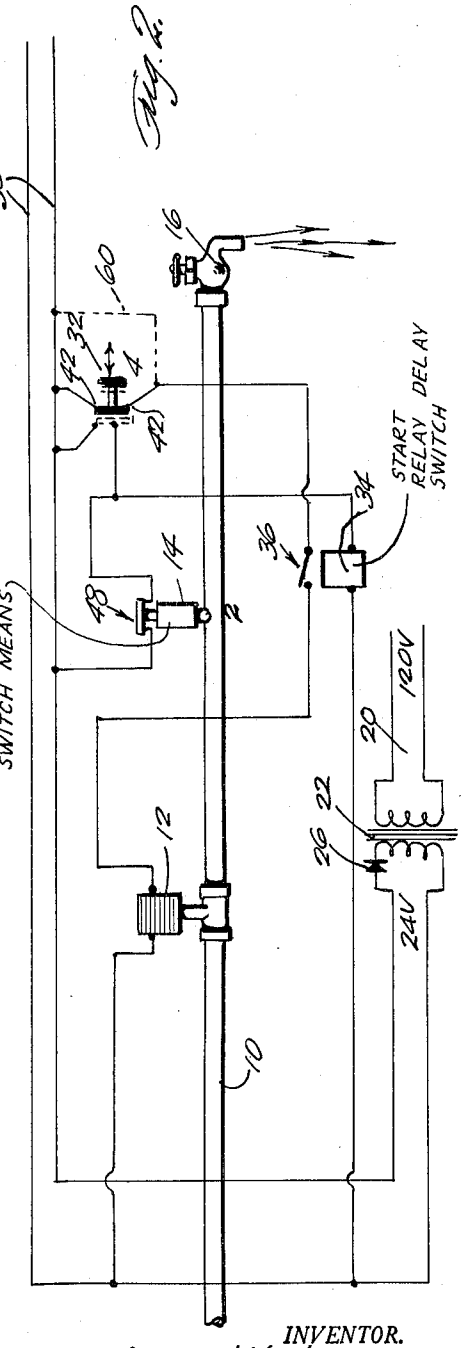


Fig. 2



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REMOTE CONTROL MEANS FOR SHUT-OFF VALVE

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ABSTRACT OF THE DISCLOSURE

A shut-off control system which automatically operates under pressure with a preset device having a normally closed circuit from an electrical source to energize it and which is automatically opened when a water line is subjected to rising pressures due to the closure of a faucet.

The present invention relates to a shut-off control system including remote control means for a shut-off valve, and more particularly, the invention relates to a shut-off control system in which automatically operated and pressure preset devices which are electrically operated remotely by control means in which a normally closed circuit from an electrical source is automatically opened when a water line is subjected to rising pressures due to the closure of a faucet.

An object therefore of the present invention is to provide a remote control for a spigot or faucet, so that when the faucet or spigot is closed, the pressure on the line is reduced by closure upstream of the spigot or faucet, of a solenoid so that the water pressure projected upon the faucet or spigot valve is substantially and effectively reduced.

A further object of the present invention is to provide a shutoff control system for water valves that may be separately coin-operable or actuable, and which are capable of being auxiliarily manually operable from the faucet.

A further object of the present invention is to provide a new and improved pressure control shutoff control system that is remotely operable by electric circuit means.

The above and other objects and advantages of the invention will become apparent upon full consideration of the following detailed description and accompanying drawings, in which:

FIGURE 1 is a circuit diagram showing the shutoff control system prior to actuation in accordance with a preferred embodiment and construction of the invention, and

FIGURE 2 shows a circuit diagram showing the circuit of the remote shutoff control system in operation after having been initiated by depression of a pushbutton switch in accordance with the teachings and advantages of the present invention.

Referring now to the drawings, there is shown a water main or pipe **10** having a solenoid valve **12** which is normally closed and disposed in communication with the pipe **10** and in which there is also a pressure sensitive switch means **14** which is normally open in communication with the line **10**, and there is shown a faucet or spigot **16** at the terminal end of the main or pipe **10**.

There is also provided in connection and as adjunct to the shutoff control system of the invention, a power source **20** comprising a pair of terminals or conductors providing 120 volts of 60 cycle house current or the like, and in which is connected thereto a transformer **22** for stepping down the current and characteristics to a rectifier **26** which provides 24 volts of electrical energy to the power lines **30**. Across the lines **30** there is connected a push button **32** and a start relay or solenoid **34** which is provided to energize the solenoid valve **12** upon energization of the start relay **34** by means of the relay contacts and switch

36. In this way, upon depression of the push button switch **32**, the momentary depression provides conduction across the contacts **38** of the push button switch **32** and forms a series circuit across the terminals **30** from the contacts **38, 38** to the start relay **34** to the other side of the line **30**. In this way the start relay is energized and the contacts and switch **36** is closed for energizing the solenoid valve **12**. Upon release of the push button **32**, the delayed opening of **36** provides a current across the other contacts **42, 42** of the push button switch, and conduction continues across the contacts and switch **36** to energize the solenoid relay valve **12**. Actuation of the solenoid valve **12** opens the line **10** so that water is communicated through the main **10** to the spigot **16** which has been opened manually prior to actuation of the push button switch **32**.

It is seen by the passage of water through and beyond the pressure sensitive switch means **14** that the switch contacts **48** are closed as shown in FIGURE 2 upon passage of water therethrough, similar to the closing of a solenoid such as used in disposal systems for kitchen sinks in which the disposal is actuated upon the flow of cold water therein. The switch means **14** and contacts **48** are similar further to a pressure responsive flow switch of a Reid Patent 2,772,409. Therefore, upon closure of the switch **48**, there is provided a holding circuit across the lines **30** through the contacts **48** and the start relay **34** so that it is maintained energized and across the mains or lines **30**. In this way, water continues to flow through the main **10** to the spigot or faucet **16** as desired. Upon the condition prevailing where sufficient water has been drawn off, then the spigot **16** may be closed manually. Upon manually closing the spigot **16**, the pressure sensitive switch means **14** is actuated to open the electrical contacts **48** so that the switch hereof is opened and the start relay **34** is deenergized. Deenergization of start relay **34** causes the relay switch **36** to correspondingly open as shown in FIGURE 1 and the initial or static condition of the system is again reached. This includes the solenoid valve **12** again closing so that water is not caused to flow through the pipe **10** to the faucet **16**. Thus it is seen that the remote control shutoff control system for water valves is a simply constructed system and is adaptable to be used in installations where there are coin operable water spigot control systems, or where it is desired to control the use of water in arid or drought areas such as New York City and the like. It is also within the purview of this application and invention to use a shorting element **60** across the normally closed contacts of pushbutton **32** so that the contacts **36** need be the only switch in that line across power lines **32** that need be closed upon starting the shutoff control system.

It may also be within the purview and contemplation of the present invention to arrange the solenoid **12** and the pressure sensitive switch means **14** so that their contacts are in series relation across the lines **30** and in which there may be a push button switch to momentarily shunt out the contacts **48**, and thus eliminate most if not all of the remainder of the control system.

Additional embodiments of the invention in this specification will occur to others and therefore it is intended that the scope of the invention be limited only by the appended claims and not by the embodiments described hereinabove. Accordingly, reference should be made to the following claims in determining the full scope of the invention.

What is claimed is:

1. A shut-off control system comprising source terminals to be connected to a source, a push-button double-pole double-throw switch connected to energize a start relay from said source terminals upon momentary depression of said push-button switch, a solenoid valve connected in a water line to open the line upon actuation

of the start relay by said push-button switch, a holding circuit connected from said push-button switch to said source terminals and including contacts of a pressure sensitive switch means which is connected downstream of said solenoid valve, and said pressure sensitive switch means holding its contacts closed until static water pressure is applied to the pressure sensitive switch means when said contacts then open, and thereby holding in circuit the start relay so that the solenoid valve is continued in its energized state, and a faucet at the end of said water line adapted to be manually closed, so that when the faucet is closed, the solenoid valve is electrically de-energized upon said static pressure being applied to said pressure sensitive switch means to open its contacts as a result of pressure rise in said water line.

2. A shut-off control system comprising a water line, a start relay having a start switch, a serial arrangement in said water line of a solenoid valve, a pressure sensitive switch means, and a faucet at the terminal end of the water line, said solenoid valve and said pressure sensitive switch means adapted to be connected in parallel upon depression and closure of a pushbutton switch,

closure of said start switch and upon passage of water through said water line through the open faucet, closure means on said faucet and, upon release of the pushbutton switch and closure of the faucet closure means, the contacts of said pressure sensitive switch means break the closed circuit formed between the start relay and the pressure sensitive switch means so that the water in said line is turned off by the solenoid valve of the control system thereof.

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