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(54) **ELECTRICALLY OPERATED STOP-COCK FOR MAINS WATER SUPPLY**

ELEKTRISCHER ABSPERRHAHN FÜR HAUPTWASSERVERSORGUNGSSYSTEM

ROBINET DE RETENUE ACTIONNE ELECTRIQUEMENT POUR ALIMENTATION EN EAU A  
PARTIR D'UN RESEAU DE DISTRIBUTION

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## Description

**[0001]** The present invention relates to a building having an electrically operated stop-cock capable of isolating an internal water distribution system from an external mains water supply and actuated by a manually operated switch, the use as a stop-cock of an electrically operated valve in combination with a manually operated switch, and a method of isolating the internal water distribution system of a building from an external mains water supply.

**[0002]** In the past domestic and industrial buildings have been provided with a manual stop-cock designed to isolate an internal water distribution system from an external mains water supply. The internal water distribution system in a domestic building typically provides hot and cold running water and may also form part of the building's heat distribution system. In an industrial building the services provided by the internal water distribution system may be far more diverse.

**[0003]** In order to isolate the internal system from the external mains, a stop-cock is usually located at the point at which the mains water supply enters the building. A typical arrangement is shown schematically in figure 1. The conduit 10 carrying the mains water supply is laid a minimum of two feet six inches (0.762 m) below ground level 12 in order that it might be protected from frost damage and crosses the property boundary 14 after first passing to a manual stop-cock 16 which is controlled by the water company. It is at this point, as far as the United Kingdom is concerned, that the responsibility for the water supply passes from the water company to the owner or occupier of the building. The water supply then passes either under or through a wall of the building 18 and rises to just above floor level 20 at which point there is provided a private stop-cock 22 operable by the owner or occupier of the building to control the quantity of water supplied thereto.

**[0004]** Turning now to a typical domestic situation, whilst people often consider turning off their heating systems or even their electricity supply while they are away from home either on holiday or on business, few people think to turn off their water supply. The consequences of not turning off the water supply however are, if anything, potentially more catastrophic. If the private stop-cock is left open the internal water distribution system of the building is connected directly to the mains supply and, via the mains supply, to a network of reservoirs. If there is a leak in the internal water distribution system this can lead, at typical rates of flow, to 240 gallons (908 litres) of water being deposited within the building every hour that the leak is not dealt with. If left, this same leak would result in 5,760 gallons (21,801 litres) of water being deposited within the building in a single period of twenty-four hours or 40,320 gallons (152,611 litres) in a week. Clearly such quantities of water can have a devastating effect both on the contents and structure of the building. Not only would it cause irreparable damage to

the electricity distribution system but the sheer weight of water could cause floors and ceilings to give way. After all, 240 gallons (908 litres) of water has a weight of approximately one ton (1,016kg), while 5,760 gallons (21,801 litres) and 40,320 gallons (152,611 litres) have weights of approximately 26 and 183 tonnes (26,417kg and 185,937kg) respectively.

**[0005]** Furthermore, if the water supplied to the building is metered and charged for by the water company in terms of the quantities used such a leak would result in a greatly increased water bill.

**[0006]** Faced with this danger why is it then that people invariably fail to turn off their water supply? It is thought that this situation arises for at two reasons.

**[0007]** Firstly, it is thought that many people do not know where their stop-cock is located while, if they do, gaining access to it means getting down on their hands and knees and fiddling around at the back of the cupboard under the sink.

**[0008]** Secondly, since the stop-cock is typically as old as the building itself, they have often seized or are so stiff as to make turning them impossible without the aid of the appropriate tools. Even with the right tools there is the danger that the application of an excessive torque might cause part of the stop-cock to shear off.

**[0009]** It is an aim of the present invention to address the problems associated with the prior art.

**[0010]** In the past one way of addressing the problem of burst water pipes within a domestic building has been to provide a plurality of flow-sensors and timing devices that cooperate with a valve to shut-off the water supply after a predetermined period, typically 15 minutes, once the flow of water has been detected. An example of one such system is described in US-A-5,004,014.

**[0011]** According to a first aspect of the present invention there is provided a building having an internal water distribution system in communication with an external mains water supply; and an electrically operated stop-cock connected to the mains water supply, and capable of isolating the internal water distribution system from the external mains water supply, characterised in that the building further comprises a manually operated switch connected to the stop-cock such that when the switch is in a first position water is able to flow continuously through the stop-cock from the external mains water supply to the internal water distribution system and when the switch is placed in a second position the stop-cock is actuated to immediately prevent further flow therethrough.

**[0012]** Advantageously the switch may be located remotely from the stop-cock.

**[0013]** Advantageously the building may be provided with an intruder alarm system to which the stop-cock is connected, the stop-cock being actuated on actuation of the alarm system.

**[0014]** Advantageously the stop-cock may comprise a solenoid valve.

**[0015]** According to a second aspect of the present

invention there is provided use as a stop-cock of an electrically operated valve means in combination with, and actuated by, a manually operated switch such that when the switch is in a first position water is able to flow continuously through the valve means from a mains water supply to a private water distribution system and when the switch is placed in a second position the valve means is actuated to immediately isolate the private water distribution system from the mains water supply.

**[0016]** According to a third aspect of the present invention there is provided a method of isolating the internal water distribution system of a building from an external mains water supply with which the internal water distribution system is in communication comprising the step of providing an electrically operated stop-cock at the junction between the internal water distribution system and the external mains water supply, characterised in that the method further comprises the steps of providing a manually operated switch connected to the stop-cock such that when the switch is in a first position water is able to flow continuously through the stop-cock from the external mains water supply to the internal water distribution system and when the switch is placed in a second position the stop-cock is actuated to immediately isolate the internal water distribution system; and operating the switch so as to move the switch from the first position to the second position.

**[0017]** Advantageously the switch may be located remotely from the stop-cock.

**[0018]** Advantageously the building may be provided with an intruder alarm system to which the stop-cock is connected and the stop-cock actuated on actuation of the alarm system.

**[0019]** Electrically operated valves, such as solenoid valves, are known and have in the past been used to control the passage of liquids such as water. Their use however as a mains water stop-cock has not previously been contemplated and enables the problems associated with the prior art to overcome. Instead of requiring specialist tools in order to rotate a stiff tap, all that is required to actuate a solenoid valve is the flick of a switch. Likewise, since the switch may be located at a position remote from the valve, the owner or occupier of the building need no longer crawl around in search of the stop-cock. Instead, the switch may be located close to the front door at the same height as the light switch so as to be easily actuated on departure.

**[0020]** In one preferred embodiment the stop-cock may be connected to an intruder alarm system and actuated on actuation of the alarm system. In this way when the owner or occupier leaves the building and as a matter of routine actuates the alarm system he simultaneously actuates the stop-cock and isolates the internal water distribution system from the mains water supply.

**[0021]** A range of electrically operated valves are manufactured by many companies such as, for example, in United Kingdom by Danfoss Limited of Perivale

Industrial Park, Greenford, Middlesex UB6 7QE.

**[0022]** One advantage of using a solenoid valve as the electrically operated stop-cock is that in the event of an electrical power failure, the valve will automatically close isolating the building's internal water distribution system from the external mains supply. If required, the valve can be reopened manually by the use of a suitable magnet before the electricity supply is restored.

**[0023]** Another advantage of a solenoid valve is that its electrical components are completely enclosed in a water-tight casing so that in the event of a leak elsewhere in the internal water distribution system the solenoid valve may still be actuated to isolate the system without endangering the user.

**[0024]** In existing buildings where a manual stop-cock is already provided, the electrically operated stop-cock may be placed in series adjacent the existing stop-cock. The existing stop-cock may then simply be left in the open position and the electrically operated stop-cock actuated in the manner previously described in order to control the supply of mains water to the building.

## Claims

1. A building having an internal water distribution system in communication with an external mains water supply; and an electrically operated stop-cock connected to the mains water supply, and capable of isolating the internal water distribution system from the external mains water supply, characterised in that the building further comprises a manually operated switch connected to the stop-cock such that when the switch is in a first position water is able to flow continuously through the stop-cock from the external mains water supply to the internal water distribution system and when the switch is placed in a second position the stop-cock is actuated to immediately prevent further flow therethrough.
2. A building in accordance with claim 1, wherein the switch is located remotely from the stop-cock.
3. A building in accordance with claim 1 or claim 2, wherein the building is provided with an intruder alarm system to which the stop-cock is connected, the stop-cock being actuated on actuation of said alarm system.
4. A building in accordance with any of claims 1 to 3, wherein the stop-cock comprises a solenoid valve.
5. A building in accordance with any of claims 1 to 4, wherein the stop-cock is connected in series with a manually operated stop-cock.
6. Use as a stop-cock of an electrically operated valve means in combination with, and actuated by, a man-

ually operated switch such that when the switch is in a first position water is able to flow continuously through the valve means from a mains water supply to a private water distribution system and when the switch is placed in a second position the valve means is actuated to immediately isolate the private water distribution system from the mains water supply.

7. A method of isolating the internal water distribution system of a building from an external mains water supply with which the internal water distribution system is in communication comprising the step of providing an electrically operated stop-cock at the junction between the internal water distribution system and the external mains water supply, characterised in that the method further comprises the steps of providing a manually operated switch connected to the stop-cock such that when the switch is in a first position water is able to flow continuously through the stop-cock from the external mains water supply to the internal water distribution system and when the switch is placed in a second position the stop-cock is actuated to immediately isolate the internal water distribution system; and operating the switch so as to move the switch from the first position to the second position.
8. A method in accordance with claim 7, wherein the switch is located remotely from the stop-cock.
9. A method in accordance with claim 7 or claim 8, wherein the building is provided with an intruder alarm system to which the stop-cock is connected and the stop-cock is actuated on actuation of said alarm system.

#### Patentansprüche

1. Gebäude mit einem inneren Wasserverteilersystem in Verbindung mit einer externen Hauptwasserversorgung; und einem elektrisch betätigten Absperrhahn, der mit der Hauptwasserversorgung verbunden ist und in der Lage ist, das innere Wasserverteilersystem von der externen Wasserversorgung zu isolieren, **dadurch gekennzeichnet**, dass das Gebäude ferner einen manuell betätigten Schalter aufweist, der mit dem Absperrhahn verbunden ist, sodass dann, wenn sich der Schalter in einer ersten Position befindet, Wasser kontinuierlich durch den Absperrhahn von der externen Hauptwasserversorgung zu dem inneren Wasserverteilersystem fließen kann, und wenn der Schalter in einer zweiten Position angeordnet wird, der Absperrhahn aktiviert wird, um einen weiteren Durchfluss durch ihn hindurch sofort zu verhindern.

2. Gebäude nach Anspruch 1, wobei der Schalter von dem Absperrhahn entfernt angeordnet ist.
3. Gebäude nach Anspruch 1 oder Anspruch 2, wobei das Gebäude mit einem Einbruchsalarmsystem versehen ist, mit dem der Absperrhahn verbunden ist, wobei der Absperrhahn bei Aktivierung des Alarmsystems aktiviert wird.
4. Gebäude nach einem der Ansprüche 1 bis 3, wobei der Absperrhahn ein Solenoidventil aufweist.
5. Gebäude nach einem der Ansprüche 1 bis 4, wobei der Absperrhahn in Serie mit einem manuell betätigten Absperrhahn verbunden ist.
6. Verwendung eines elektrisch betätigten Ventilmittels als Absperrhahn in Kombination mit und betätigt durch einen manuell betätigten Schalter, sodass dann, wenn sich der Schalter in einer ersten Position befindet, Wasser kontinuierlich durch das Ventilmittel von der Hauptwasserversorgung zu einem privaten Wasserverteilersystem fließen kann, und wenn der Schalter in einer zweiten Position angeordnet wird, das Ventilmittel aktiviert wird, um das private Wasserverteilersystem von der Hauptwasserversorgung sofort zu isolieren.
7. Verfahren zum isolieren des inneren Wasserverteilersystems eines Gebäudes von einer externen Hauptwasserversorgung, mit der das innere Wasserverteilersystem verbunden ist, umfassend den Schritt, einen elektrisch betätigten Absperrhahn an der Verknüpfung zwischen dem inneren Wasserverteilersystem und der externen Hauptwasserversorgung vorzusehen, **dadurch gekennzeichnet**, dass das Verfahren ferner die Schritte umfasst, einen mit dem Absperrhahn verbundenen manuell betätigten Schalter vorzusehen, sodass dann, wenn sich der Schalter in einer ersten Position befindet, Wasser kontinuierlich durch den Absperrhahn von der externen Hauptwasserversorgung zu dem inneren Wasserverteilersystem fließen kann, und dann, wenn der Schalter in einer zweiten Position angeordnet wird, der Absperrhahn aktiviert wird, um das innere Wasserverteilersystem sofort zu isolieren; und Betätigen des Schalters zur Bewegung des Schalters von der ersten Position zu der zweiten Position.
8. Verfahren nach Anspruch 7, wobei der Schalter von dem Absperrhahn entfernt angeordnet ist.
9. Verfahren nach Anspruch 7 oder Anspruch 8, wobei das Gebäude mit einem Einbruchsalarmsystem versehen ist, mit dem der Absperrhahn verbunden ist, und der Absperrhahn bei Aktivierung des Alarmsystems aktiviert wird.

## Revendications

1. Bâtiment comportant un système de distribution d'eau interne en communication avec un réseau d'alimentation en eau externe ; et un robinet d'arrêt actionné électriquement raccordé au réseau d'alimentation en eau, et adapté à isoler le système de distribution d'eau interne du réseau d'alimentation en eau externe, caractérisé en ce que le bâtiment comprend également un interrupteur actionné manuellement relié au robinet d'arrêt de manière que lorsque l'interrupteur est placé dans une première position, l'eau puisse s'écouler en continu via le robinet d'arrêt du réseau d'alimentation en eau externe au système de distribution d'eau interne et lorsque l'interrupteur est placé dans une deuxième position, le robinet d'arrêt soit actionné pour empêcher immédiatement la poursuite de l'écoulement d'eau via le robinet d'arrêt. 5 10 15
2. Bâtiment selon la revendication 1, dans lequel l'interrupteur est situé à distance du robinet d'arrêt. 20
3. Bâtiment selon la revendication 1 ou la revendication 2, dans lequel le bâtiment est équipé d'un système d'alarme d'effraction auquel le robinet d'arrêt est raccordé, le robinet d'arrêt étant actionné lors de l'actionnement dudit système d'alarme. 25
4. Bâtiment selon l'une quelconque des revendications 1 à 3, dans lequel le robinet d'arrêt comprend une électrovanne. 30
5. Bâtiment selon l'une quelconque des revendications 1 à 4, dans lequel le robinet d'arrêt est raccordé en série avec un robinet d'arrêt actionné manuellement. 35
6. Utilisation comme robinet d'arrêt d'un moyen de vanne actionné électriquement en combinaison avec, et actionné par, un interrupteur actionné manuellement de manière que lorsque l'interrupteur est placé dans une première position, l'eau puisse s'écouler en continu via le moyen de vanne d'un réseau d'alimentation en eau à un système de distribution d'eau privé et lorsque l'interrupteur est placé dans une deuxième position, le moyen de vanne soit actionné pour isoler immédiatement le système de distribution d'eau privé du réseau d'alimentation en eau. 40 45 50
7. Procédé pour isoler le système de distribution d'eau interne d'un bâtiment d'un réseau d'alimentation en eau externe avec lequel le système de distribution d'eau interne est en communication, comprenant les opérations consistant à disposer un robinet d'arrêt actionné électriquement à la jonction entre le système de distribution d'eau interne et le réseau d'alimentation en eau externe, caractérisé en ce que le procédé comprend également les opérations consistant à employer un interrupteur actionné manuellement relié au robinet d'arrêt de manière que lorsque l'interrupteur est placé dans une première position, l'eau puisse s'écouler en continu via le robinet d'arrêt du réseau d'alimentation en eau externe au système de distribution d'eau interne et lorsque l'interrupteur est placé dans une deuxième position, le robinet d'arrêt soit actionné pour isoler immédiatement le système de distribution d'eau interne ; et actionner l'interrupteur de manière à déplacer l'interrupteur de la première position à la deuxième position. 55
8. Procédé selon la revendication 7, dans lequel l'interrupteur est situé à distance du robinet d'arrêt.
9. Procédé selon la revendication 7 ou la revendication 8, dans lequel le bâtiment est équipé d'un système d'alarme d'effraction auquel le robinet d'arrêt est raccordé et le robinet d'arrêt est actionné lors de l'actionnement dudit système d'alarme.

*FIG. 1.*

