

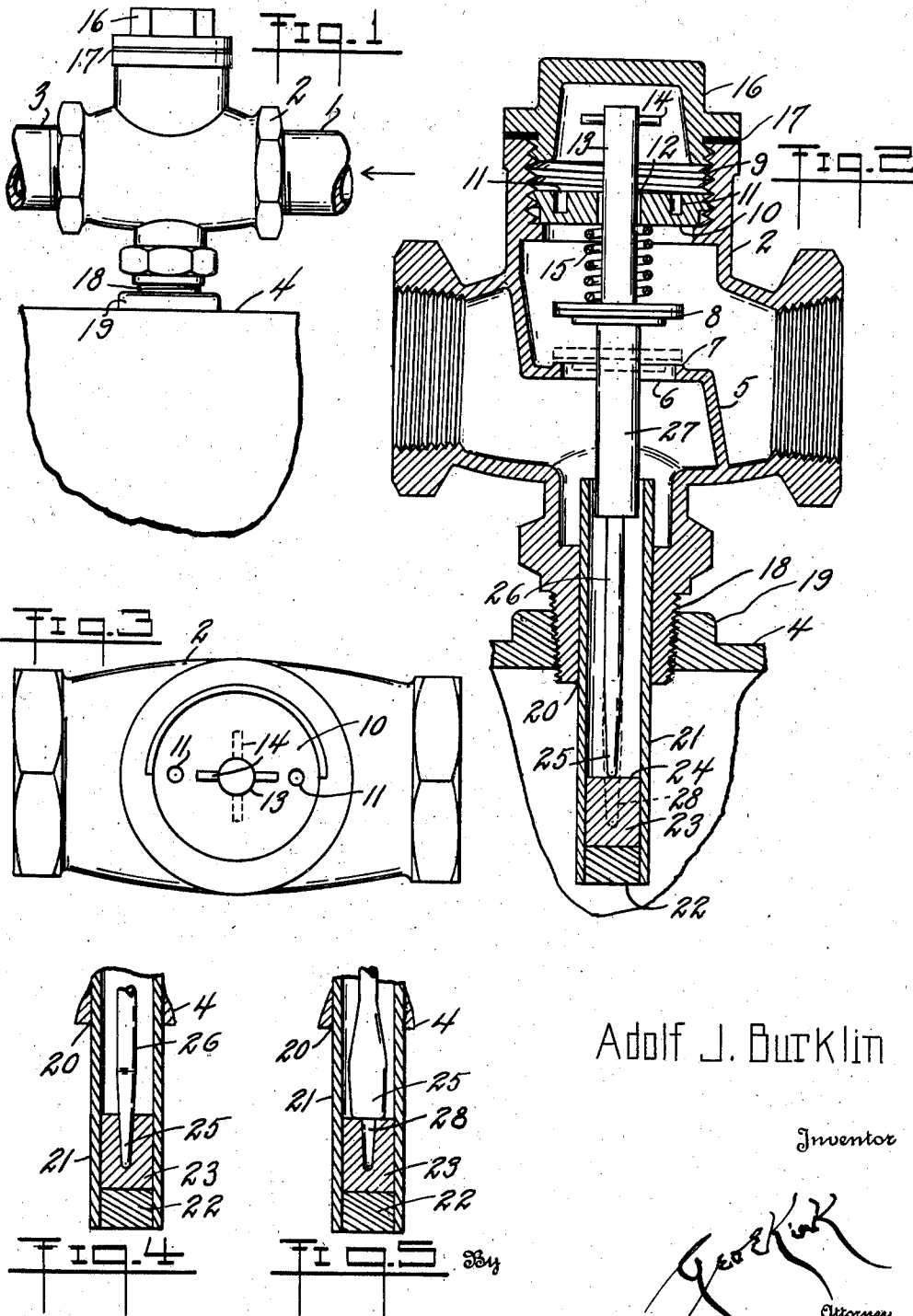
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SHUT-OFF VALVE

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## UNITED STATES PATENT OFFICE

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## SHUTOFF VALVE

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2 Claims. (Cl. 137-162)

This invention relates to temperature operated or release valves.

This invention has utility when incorporated in a safety gas shut-off valve having a fusible pool for releasing the valve for closing at excess temperature.

Referring to the drawing:

Fig. 1 is a side elevation, with parts broken away, of an embodiment of the invention in a gas shut-off valve, say for the fuel supply line to a gas heater for heating or warming water in a tank;

Fig. 2 is a medial vertical section through the valve of Fig. 1, with the blade reposing on the congealed pool, the dotted line showing being of the stem in shifted position after submergence;

Fig. 3 is a plan view of the valve of Fig. 1, with the cap removed to expose the guide stem as adapted for manual re-setting;

Fig. 4 is a view of the thermal control or fusible pool, showing in full line position the submergence of the stem; and

Fig. 5 is a view of the re-set or angular shifted position for the stem or blade as to the congealed pool.

Gas supply line 1 passes to valve housing 2 and therefrom by line 3 say to a water heater for thereby warming water or other liquid in tank 4. This valve housing 2 has therein partition 5 having therethrough opening 6, bounded by seat 7, against which may rest closure 8 at cut-off position for this valve between the gas supply line 1 and the gas delivery line 3. This housing 2 has internally threaded portion 9 into which may be threaded guide disk 10 having wrench receiving openings 11 and central guide-way 12. Rising from this closure 8 to pass through the opening 12 is upper stem portion 13 having cross pin 14. With this stem section 13 fixed to the closure 8 there is permitted the rotation of this closure 8 relatively to the housing 2. In practice, this running of the disk 10 down in the internally threaded portion 9 of the housing is an adjustment for the compression action of helical spring 15 set between this disk 10 and the closure 8. The terminus of the internally threaded portion 9 may be engaged by cap 16 which, as run to position, may compress packing washer 17. Oppositely from this internally threaded portion 9 and housing 2 has externally threaded portion 18 which has tight assembly with internally threaded boss 19 of the tank 4. This externally threaded portion 18 has, coaxially therewith, way 20 in axial alignment

with the guide-way 12 and the seat 7. For drive or brazed fit in this opening 20 is tube or sleeve 21 having bottom closure plug 22. The lower end of this tube or sleeve 21 thereby forms a receptacle for pool 23 of fusible material, on congealed surface 24 of which may rest upwardly flaring blade portion 25 from stem extension 26 anchored in major stem 27 as guided by the upper portion of the sleeve 21. This portion 27 for mounting the stem 26 is a coaxial stem fixed with the closure 8 for this valve.

There is in the selection of the fusible material 23 a substance which in practice at the temperature of use, may not be dissipated or be affected hurtfully by the gas or fuel passing from the line 1 to the line 3. The sleeve 21 is a guide for the stem portion 27. The pool 23 may be of metal as lead, alloy or other desired melting point determined for functioning at fusing. Furthermore, the pool may be of a non-metal such as sulphur, antimony, or other responsive medium, even into the organic field. The pool, upon congealing, releases the blade 25, or at least should not adhere with the substance of the pool. At once the pool fuses, the blade is thrust thereinto. This means that the gas supply in this valve control is at once shut off and there is not further heating of the tank 4. Resulting lowering of the temperature allows the pool 23 to re-congeal. For re-establishing functioning of the valve, the operator may remove the cap 16, engage the cross bar 14 to lift it against the resistance of the spring 16. The blade is then moved clear of the pool 23 and angularly shifted to out-of-register position with this pool pocket 28. The valve is thus re-set for the closure 8 to be spaced from the seat 7. This is a re-assembly which may be repetitive as the occasion requires for the heater to be re-ignited. What is claimed and it is desired to secure by Letters Patent is:

1. In combination with a valve housing having a seat, a closure for the seat, a relatively rotatable stem on which the closure is mounted, actuating means tending normally to urge the closure toward the seat, said housing comprising a chamber fixed therewith, one portion of said stem providing a stem terminus in said chamber, there being in the chamber a fusible pool of material of such character as not to form a bond with the stem, the pool being normally congealed to hold the stem terminus abutting the surface of the pool in opposition to said actuating means to maintain the closure clear of the seat, said congealed pool surface being of less dis-

tance from the valve seat than the closure is from the stem terminus in the chamber, the pool in its fused condition having the stem terminus thrust thereto by said actuator means, said stem terminus having such a configuration that it may be readily withdrawn from the re-congealed pool to leave an opening in the pool and to make said stem terminus capable of being moved out-of-registry with said opening when the stem is relatively rotated, and means to effect relative rotation between the re-congealed pool and the configured stem terminus to bring said terminus, after withdrawal clear of the pool, into an out-of-registry position with the opening formed by the withdrawal of the stem from the pool and thereby position the stem terminus so that the re-congealed pool will hold the closure unseated, whereby on re-fusing the pool the stem terminus may again enter the pool and the valve be reclosed.

2. In combination with a valve housing having a seat, a closure for the seat, a rotatable stem on which the closure is mounted, spring means tending normally to urge the closure toward the seat, said housing comprising a chamber fixed therewith, one portion of said stem providing a stem terminus in said chamber, there being in

the chamber a fusible pool of material of such character as not to form a bond with the stem terminus, the pool being normally congealed to hold the stem terminus against the surface of the pool in opposition to the spring means to maintain the closure clear of the seat, said congealed pool surface being of less distance from the valve seat than the closure is from the stem terminus in the chamber, the pool in its fused condition having the stem terminus thrust thereto by said spring means, said stem terminus having such a tapered configuration that it may be readily withdrawn from the re-congealed pool to leave an opening in the pool and to make said stem terminus capable of being moved out-of-registry with said opening when the stem is rotated, and means to effect relative rotation between the re-congealed pool and the configured stem terminus to bring said terminus, after withdrawal clear of the pool, into an out-of-registry position with the opening formed by the withdrawal of the stem from the pool and thereby position the stem terminus so that the re-congealed pool will hold the closure unseated, whereby on re-fusing the pool the stem terminus may again enter the pool and the valve be reclosed.

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