

F. V. SACKETT.  
 SPRINKLER HEAD.  
 APPLICATION FILED SEPT. 12, 1912.

1,107,845.

Patented Aug. 18, 1914.

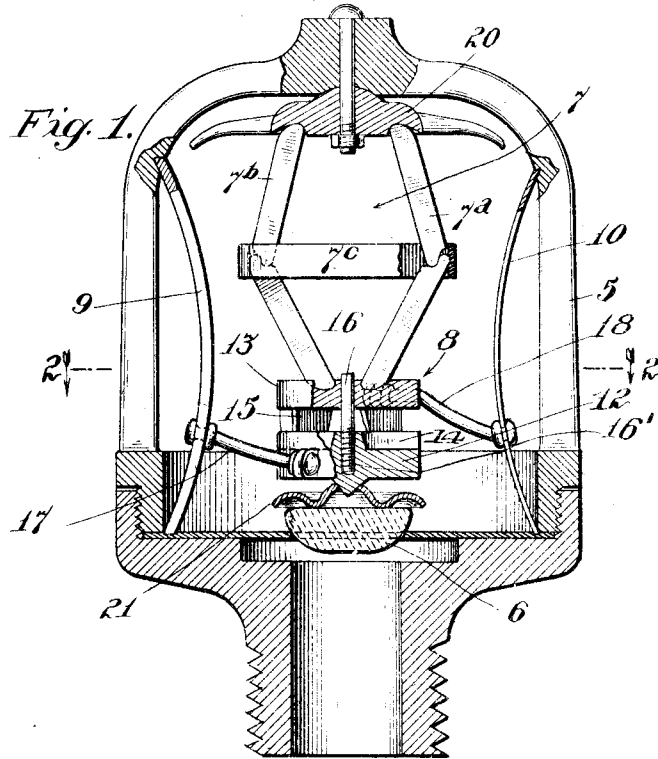
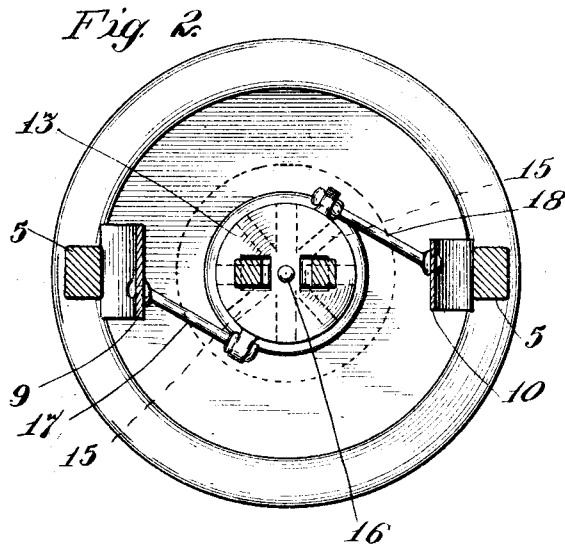
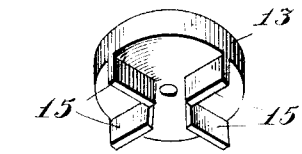
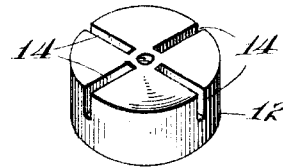


*Fig. 3.*



Witnesses:  
 Milton L. Linn  
 W. Linn Allen

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# UNITED STATES PATENT OFFICE.

FRANK V. SACKETT, OF LA GRANGE, ILLINOIS.

## SPRINKLER-HEAD.

1,107,845.

Specification of Letters Patent.

Patented Aug. 18, 1914.

Application filed September 12, 1912. Serial No. 719,910.

*To all whom it may concern:*

Be it known that I, FRANK V. SACKETT, a citizen of the United States, residing at La Grange, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Sprinkler-Heads, of which the following is a specification.

My invention relates to improvements in sprinkler heads for employment in connection with the fluid piping of fire-extinguishing automatic sprinkler systems.

The primary object of my invention is to provide a sprinkler head which may be set to release upon the rapid rise in temperature regardless of the ultimate temperature reached, but not responsive to slow variations in temperature at least below a predetermined high-temperature.

A further object of my invention is to provide such a sprinkler head in arrangement which may be made responsive also to the attainment of a predetermined temperature which may be regarded as danger temperature, whether attained slowly or rapidly.

In fire-extinguisher sprinkler systems it is customary to have the releasing element of the sprinkler head restrained by a fusible body which is adapted to soften at a predetermined temperature thereby to release the head and permit the automatic distribution of water, but it sometimes happens that the efficacy of the sprinkler system is greatly decreased by reason of the requirement that a predetermined danger temperature be attained before the release occurs. Thus in open air installations in cold weather a fire may be well under way before the heat applied to the sprinkler head is sufficient to release them, as the initial temperature from which the rise starts may be very low.

My invention aims to provide a sprinkler head wherein the sudden rise of temperature, whether altogether within low limits or altogether within high limits, will result in the release of the sprinkler head and the automatic distribution of water, although slower temperature changes due to weather conditions and the like will have no releasing influence upon the structure.

In the drawings I have shown an embodiment of my invention, wherein—

Figure 1 is a side view with parts in section of a sprinkler head; Fig. 2 is a section on line 2—2 of Fig. 1; and Fig. 3 is an isometric detail of two disk members forming part of the device.

In the drawings, 5 indicates in general a frame, 6 a valve closing the water orifice opening through the frame, 7 a strut structure, and 8 a valve-releasing structure arranged for operation through compensating mechanism comprising, in the embodiment shown, two temperature-responsive springs 9 and 10, located in the frame and connected for coaction with the releasing structure. Specifically, in the construction shown, the release structure 8 takes the form of complementary disks 12 and 13, the lower disk having in its upper face radial slots 14 and the upper disk having on its lower face tooth projections 15 adapted to interfit therewith. Normally, the teeth are arranged out of register with their opposing slots so that rotary motion of the upper disk 13 about an axis defined by pin 16 taking into an aperture 16' of the lower disk 12 is necessary to bring the slots and teeth into register and enable the two disks to be forced toward each other or condensed.

The compensating springs 9 and 10 are respectively relatively heavy and relatively light, so that, while under slow variations in temperature they will expand and contract substantially equally, the lighter spring is very much more quickly responsive to changes in temperature than the heavy spring, whereby sudden changes in temperature will cause very unequal expansion between the heavy and light springs, the light spring operating first. The two disks are connected to the respective springs for rotation thereby in like direction under the influence of expansion, the rotation being such that the side toward the observer in Fig. 1 moves from left to right. Connections for rotation from the disk to the spring is effected by radius bars 17 and 18. The releasing structure as a whole is made bodily rotatable. This may be done in various ways but in the specific construction

shown the strut structure 7 bears against a rotatable sprayer 20, located at the top of the frame, while the lower disk 12 has a center point connection for rotation with the compensating washer 21 which bears upon the glass valve 6.

Now it will be seen that, regardless of details of construction, the general operation of the device is to cause rotary motion of the releasing device as a whole, to take place during all slow change of temperature, the heavy and light springs expanding and contracting substantially equally and transmitting their motion substantially uniformly to the two disks which thereby rotate in unison. Where however a sudden variation in temperature occurs, while both disks rotate in the same direction the rotation of the upper disk is much more rapid than that of the lower disk so that there is relative movement between the two disks, this being due to the greater rapidity of the expansion and contraction of the lighter spring 10, to which the upper disk is connected. The arrangement of the parts is such that no degree of contraction can move the upper disk backward with respect to the lower disk to bring the slots and teeth into register, but if the temperature change is a rise in temperature the rapidly expanding light spring will move the upper disk so much faster than the lower disk is moved by the heavy spring that the teeth of the upper disk are brought into register with the subjacent slots of the lower disk, and thereby the water pressure, or other pressure relied upon for release, may effectually open the valve and drive the strut and release device out of the way. In order that this complete freeing of the spray may readily occur, I prefer that the springs shall be only frictionally socketed in the frame, as shown.

If desired the strut 7 may be made in the form of a releasing member, and in the specific construction shown, I have indicated said strut as formed of two elements 7<sup>a</sup> and 7<sup>b</sup> normally held in united relation by a fusible link 7<sup>c</sup>, there being many forms of fusible struts available which may be employed in such environment.

While I have herein disclosed an embodiment of my invention which I believe to be new and advantageous in detail, and some details of which I may claim for their specific advantages, it will be apparent to those skilled in the art that in its broad aspects my invention is not limited to the specific con-

struction shown, but may be embodied in many forms within the spirit of the invention and within the scope of the appended claims.

What I claim is:

1. An automatic sprinkler head providing a valve, mechanical means differently responsive to sudden variations in temperature but similarly responsive to gradual variations, and means normally maintaining said valve in closed position operable to release said valve by the differential action of said temperature responsive means.

2. In a sprinkler head, a valve, means normally holding said valve in closed position comprising a plurality of parts relatively movable to effect a release of the valve, and a plurality of parts differently responsive to variations in temperature, said parts respectively connected with the relatively movable release parts to move said release parts to releasing position through differential action of the thermo-responsive parts.

3. In a sprinkler head, the combination of a frame, a valve and a plurality of parts between said frame and valve telescopically movable when in one position and normally standing in distended position, said parts being relatively movable toward said position, and differentially acting thermo-responsive devices, connected to said parts to move them to telescoping position under the influence of sudden rise in temperature.

4. In a sprinkler head, the combination of a valve, means normally holding said valve in closed position operable to release the valve at a predetermined temperature, and means automatically operable to release said valve in response to sudden rise in temperature.

5. In a device of the character described, the combination of a frame having an opening, a valve for said opening, a rotatable structure interposed between said frame and valve including a pair of relatively rotatable disks arranged to condense their joint axial length when in one position of relative rotation, and differentially acting thermo-responsive springs connected with said disks to rotate them in like direction but at different rates under rapid rise in temperature.

In testimony whereof I hereunto set my hand in the presence of two witnesses.

FRANK V. SACKETT.

In the presence of—  
MARY F. ALLEN,  
W. LINN ALLEN.