The present invention relates to therma-
ly controlled sprinkler apparatus for build-
ings and more particularly to means for re-
leasably initiating the flow of water in the
5 event of sufficient heat being generated in
the vicinity of the device, and in the provi-
sion of control means for the device.

More specifically the present device is a
sprinkler head constructed and arranged to
10 release a flow controlling valve in the head
upon excess of temperature, such as would
be produced in the event of a fire, thereby
releasing a fire extinguishing spray of wa-
ter.

Most devices of this nature rely for their
operation upon the melting of a fusible link
directly from the heat of the fire, this melt-
ing, releasing certain elements which per-
mit the spray valve to open.

The sprinkling device, however, must per-
15 form be located at a sufficient height above
the floor to permit of a spraying over a wide
area, and a fire starting adjacent the floor
may gain considerable headway before

5 heat therefrom reaches a sufficient tem-
perature at the location of the fusible link
to permit the sprinkler to come into action.
and accordingly, one of the objects of the
20 present invention is to provide means lo-
cated at a strategic point in the room, as
for example adjacent the floor or in any
other suitable position for controlling the
sprinkler even before the heat from the fire
is sufficiently great to directly melt the link.

Another object resides in the provision of
25 valve releasing means, which while adapted
for remote control is also capable of being
directly controlled, should the fire occur close
to the sprinkler.

The present invention contemplates a
sprinkler head having a pair of toggle arms
which are held normally tensioned by a fusi-
30 ble link, thereby to hold the flow controlling
valve closed, but which upon melting of the
link will release the valve. While the link
itself may be melted directly by the fire, a
thermostat or thermostatic switch is pro-
vided in electrical connection with the link
whereby upon actuation of the thermostat
by heat from a fire, a current of electricity

sufficiently strong to fuse the link will be
passed through the device and the valve thus
released.

To the attainment of these and other ob-
gects of the invention which will appear as
the description proceeds, reference is made
to the accompanying drawing, in which:

Fig. 1 represents a side elevation partly in
section of the sprinkler head and the control
device;

Fig. 2 represents a section taken on line
2—2 of Fig. 1;

Fig. 3 is an elevation looking to the left
of Fig. 1; and

Fig. 4 is a detail perspective of a toggle
lever link which controls the device.

The general principles and construction
of this device are similar in the main to the
many similar articles and systems hereto-
fore proposed and on the market, but, in
the accompanying description in which like
reference numerals designate like parts, it
will be seen that there is provided a head
35 or frame member 10 having a hollow,
threaded portion 11 by means of which the
head is mounted in a pipe line. At the top
of the frame, is a spreader or deflector 12
which acts, upon operation of the device to
throw the water issuing from the hollow
threaded portion 11 over the controlled
area. This spreader is adjustably mounted
by means of a threaded stem 13 in the frame
10, the stem having a notch 14 at its lower
end.

The upper end of the hollow, threaded
portion 11 is formed with a seat 16 for a
valve 15, this valve having a notch 17 dis-
posed substantially opposite to the notch
14, and both notches are located on the cen-
ter line of the frame.

A pair of toggle levers 18 and 19 are pro-
vided, the upper lever 18 having a portion
seating in the notch 14 and the lower lever
19 having a similar portion seated in the
notch 17. A toggle link 20 is pivoted at
21 to the link 19, and a second toggle link
22 formed of insulating material, such as
Bakelite, is pivoted at 23 to the lever 18.
This link 22 is provided with a bifurcated
extension 24 in advance of its pivotal point

100
and the link 20 is provided at its free end with a pin 25 extending from both sides of the link, whereby when the link 20 is mounted in the bifurcated portion 24, the pin will engage the sides of the portion 24 and retain the links normally in engagement.

Connecting the end of the link 22 opposite its bifurcated portion, with the lever 19 is a fuse link 26, this fusible member being retained in position by a terminal bolt 27 in the link 22, and a similar terminal bolt 28 in the lever 19. It will be obvious that the links 20 and 22, when held in position by the fusible member 26, (Fig. 1) will act to retain the toggle levers 18 and 19 against movement, and that, by virtue of the leverage provided through use of the links, less tensile strain is placed on the member 26 than would be the case if the links were omitted.

Suitable leads 29 and 30 are provided from the terminals 27 and 28 to a thermostatic switch 21 located at a suitable point in the room, thus placing the fuse 26 in a circuit normally held open by the thermostat, but adapted to be closed upon actuation thereof. Between the opposite ends of the toggle levers from the links, a rocker hinge 31 is provided, which hinge acts as a spacer during assemblage of the links and levers.

In assembling the device, after the links are connected, at one end of the levers, the other end of the levers 18 and 19 are placed in their respective seats 14 and 17 with the hinge 31 therebetween and held in place by tension. The tension is applied by adjustment of the spacer 12 through its threaded portion 18 on the one side, and by pressure of water against the valve 15 from the other side. This adjustment and pressure, places compression on the levers at one side of spacer 31, and the fuse 26 and the links 20 and 22 act to prevent movement of the levers on the other side of the spacer, and hence are placed under a tension.

The device may be assembled by placing an initial tension through depression of link 22, and final tension through adjustment of spacer 12, it being understood that the ends of lever 18 and 19 and the spacer 31 have been placed in the frame 10.

Having thus described the invention, the operation thereof is readily apparent. The terminal nut 10 being attached to the thermostatic switch, acts to connect the thermostat to the fusible element 26, and the thermostat upon operation caused by the action of heat generated by fire in the vicinity closes the circuit through the fusible element, which fusible element, as stated above, is preferably wire, formed of easily melttable material. Being unable to stand the load the fuse will melt thus removing all restraint from the link 22 and permitting same to partake of a pivotal movement. This movement will release the pin 25 and thus remove the tension from the toggle levers 18 and 19.

It should be noted that the rocker hinge is located slightly off center from a line passing centrally through the notches 14 and 17 (see line 2—2 of Fig. 1), and as the downward pressure from the spacer is along this line, obviously such pressure is only from the fulcrum formed by hinge 31 to the line, and from the fulcrum to the outer ends of the levers 18—19, there will be a tendency toward upward movement which movement is normally prevented by the elements 22 and 20, which are restrained by the fuse 26.

Consequently, upon a deficiency of the fuse 26 the water pressure will cause an upward movement of the end of lever 19, about the hinge 31 as a fulcrum, and this movement will tend to drop the right hand end (as viewed in Fig. 1) of the lever 19 drawing down the link 20, while the terminal end of link 22 is rising.

As this toggle movement is taking place, the valve 15 is, of course, opening wider until the entire toggle device has become unseated, and is free to drop, whereupon the water being projected by its own pressure against the spacer 12, will act to extinguish the fire.

Of course, should the fire occur at a point adjacent the sprinkler, heat therefrom will melt the fuse 26 just as effectively as an overload passed by the thermostat.

The invention then provides a simple effective sprinkler head, wherein the parts, when assembled, act to close a flow controlling valve, but in which release of the valve may be effected by direct action of heat or by indirect action of a thermostatically controlled electric circuit which is in turn operable through the action of heat.

Having thus described my invention, what I claim as new and desire to secure by Letters Patent of the United States is:

1. The combination with a sprinkler head having a flow controlling valve, of a toggle device for holding the valve on its seat, including means for placing stress upon said toggle device when in operative position, whereby to retain same in valve holding position, means in said sprinkler head cooperative with said first means for placing stress upon said device, and means to retain said device under stress, said last means being operable under the action of heat to release the device from such stress, said first means including an insulating member, thermally responsive means, and electro-conductive means connecting said thermal responsive means through said insulating member to said stress retaining means.

2. A thermo-electric sprinkler head, comprising a flow controlling valve, a toggle de-
vice for seating said valve, means for placing said device under stress, said toggle device consisting of toggle levers, a fulcrum member and a pair of toggle links pivoted respectively to said levers and engageable with each other to restrain said levers from movement, one of said links being pivoted adjacent an end, to its lever and having its other end extending from the lever and thermally controlled means connecting said extended end to the other lever thereby to retain said links in engagement and effective under the action of heat to permit a dis-engagement of said links.

3. A thermo-electric sprinkler head, comprising a flow controlling valve, a toggle device for seating said valve, means for placing said device under stress, said toggle device consisting of toggle levers, a fulcrum member and a pair of toggle links pivoted respectively to said levers, and engageable with each other to restrain said levers from movement, one of said links being pivoted adjacent an end, to its lever and having its other end extending from the lever and a fusible link connecting said extended end to the other lever thereby to maintain said device under stress until fusing of the link.

4. A thermo-electric sprinkler head, comprising a flow controlling valve, a toggle device for seating said valve, means for placing said device under stress, said toggle device consisting of toggle levers, a fulcrum member and a pair of toggle links pivoted respectively to said levers, and engageable with each other to restrain said levers from movement, one of said links being pivoted adjacent an end, to its lever and having its other end extending from the lever, a terminal on said extended end, and thermally controlled means connecting said terminal to the other of said levers for maintaining said device under stress, constructed to release said device under influence of an electric overload, and thermostatically controlled means connected to said terminal and to said lever for passing an electric overload through said last means.

5. A thermo-electric sprinkler head, comprising a flow controlling valve and a water deflector, a toggle device for seating said valve, means for placing said device under stress, including said deflector, said toggle device consisting of toggle levers, a fulcrum member and a pair of toggle links pivoted respectively to said levers and engageable with each other to restrain said levers from movement, one of said links being pivoted adjacent an end to its lever, and having its other end extending from the lever being of insulating material and a fusible link connecting said extended end to the other lever thereby to maintain said device under stress until fusing of the link, and thermally controlled means for passing an electric overload through said terminal and fusible link. 6. A thermo-electric sprinkler head, comprising a flow controlling valve, a toggle device for seating said valve, means for placing said device under stress, said toggle device consisting of toggle levers, a fulcrum member and a pair of toggle links pivoted respectively to said levers, and engageable with each other to restrain said levers from movement, one of said links being pivoted adjacent an end to its lever, and having its other end extending from the lever being of insulating material and carrying an electric terminal, and a fusible link connecting said extended end to the other lever thereby to maintain said device under stress until fusing of the link, and thermostatically controlled means for passing an electric over-load through said terminal and fusible link.

7. A thermo-electric sprinkler head, comprising a flow controlling valve, a toggle device for seating said valve, means for placing said device under stress, said toggle device consisting of toggle levers, a rocker hinge forming a fulcrum between the ends of said levers, and a pair of toggle links pivoted respectively to said levers and engageable with each other to restrain said levers from movement, one of said links being pivoted adjacent an end, to its lever and having its other end extending from the lever and thermally controlled means connecting said extended end to the other lever thereby to retain said links in engagement, and effective under the action of heat to permit a dis-engagement of said links.

8. A thermo-electric sprinkler head, comprising a flow controlling valve, a toggle device for seating said valve, means for placing said device under stress, said toggle device consisting of toggle levers, a fulcrum member and a pair of toggle links pivoted respectively to said levers, having a bifurcated end and the other having a projecting pin engageable with said end, whereby said links, when engaged, restrain said levers from movement, said first link being pivoted adjacent its bifurcated end to its lever and having its other end extending from the lever and thermally controlled means connecting said extended end to the other of said levers to retain said links and levers in engagement, said means being effective under the action of heat to permit a dis-engagement of said links.

9. A thermo-electric sprinkler head, comprising a flow controlling valve, a toggle device for seating said valve, means for placing said device under stress, said toggle device consisting of toggle levers, a fulcrum member and a pair of toggle links, one of which is pivoted intermediate its
ends to one of said levers, and the other of which is pivoted at its end to the other of said levers, said first link having a forked end and said second link having a projection at its free end engageable with the fork of said first link, whereby to restrain said levers from movement, and thermally controlled means to retain said links in engagement, effective under the action of heat to permit a dis-engagement of said links.

10. The combination with a sprinkler head having a flow controlling valve and a water deflector, of a toggle device for holding the valve on its seat, means forming part of said device for placing stress upon said toggle device when in operative position, said deflector having a portion cooperative with said first means for placing stress upon said device, said first means including an insulating member, electrically fusible means normally retaining the toggle device under stress effective under the action of heat to release said valve and having a terminal extending through said member, and thermostatically controlled means, connected in circuit with said fusible means and terminal to pass electric currents to said fusible means.

In testimony whereof I hereunto affix my signature.

CHARLES E. GREEN.