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ADJUSTABLE DROP SPRIG FOR A FIRE SPRINKLER SYSTEM

Filed Sept. 18, 1961

FIG. 1

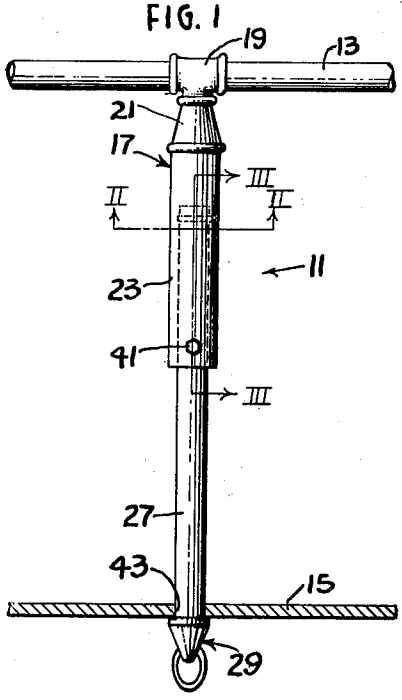



FIG. 2

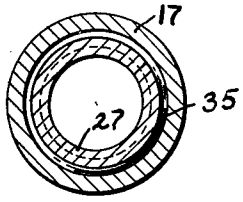



FIG. 3

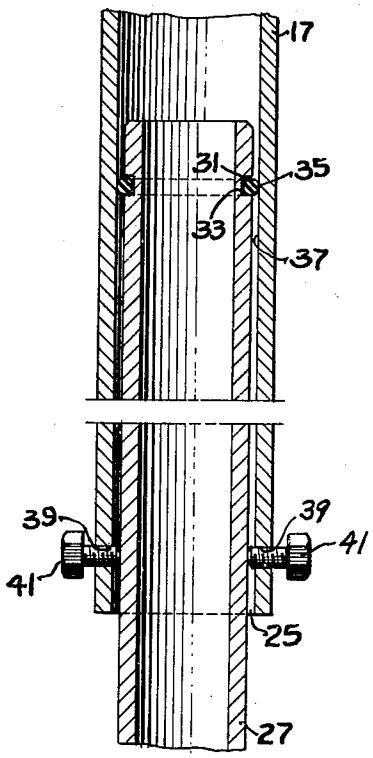
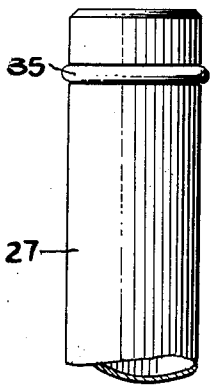



FIG. 4




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# ADJUSTABLE DROP SPRIG FOR A FIRE SPRINKLER SYSTEM

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This invention relates to an improved drop sprig of the type used in a fire sprinkler system.

The usual practice in fire sprinkler systems is to have water carrying pipes which run horizontally through a building and from which at spaced intervals are provided so-called drop sprigs which depend from the horizontal pipes and carry the water to the respective sprinkler heads attached to the lower ends of the sprigs. Some of these fire sprinkler systems are designed to have the sprinkler heads flush against the ceiling. In installing a sprinkler system it becomes a problem and is time consuming to make the sprig the correct length to position the sprinkler head exactly flush against the ceiling, particularly in that type of construction having an acoustical ceiling which is lower than the permanent ceiling. In this type of ceiling there is usually quite a variation in the distance from the horizontal pipes to the acoustical ceiling due to construction and manufacturing variations, etc. The present practice is to thread each sprig into the horizontal pipe, measure the length necessary by making a mark on the sprig adjacent the acoustical ceiling, take the sprig down to thread the lower end thereof, screw it back into the horizontal pipe, and finally screw the sprinkler head into place. Also, in other types of installations where the sprigs are arranged so that the sprinkler heads are spaced below the ceiling, many times it is desirable to be able to move the sprigs out of the way so that they will not be knocked against and bent out of place. As for example, when other craftsmen are working in the area with ladders, etc., it is not possible to move the sprigs of the heretofore known types without having first to cut the water off, drain the system, and then unscrew the sprigs.

The present invention is directed towards overcoming the above mentioned and other problems relative to sprinkler systems by providing an adjustable drop sprigs.

Thus, one of the objects of the present invention is to provide in a fire sprinkler system a drop sprig comprising telescopically joined upper and lower pipes so arranged that the lower pipe may be adjusted to position the sprinkler head at the desired height.

A further object is to provide such a drop sprig that is provided with means for efficiently and effectively sealing the upper and lower pipes against any flow of water between said pipes.

A further object is to provide in such a drop sprig sealing means which provides a tighter seal as the water pressure is increased.

A further object is to provide such a drop sprig that can be adjusted when water pressure is in the sprinkler system.

A further object is to provide such a drop sprig in which the sprinkler head can be rotatably adjusted.

A further object is to provide, in the type of sprinkler system in which the sprinkler heads are spaced below the ceiling, an adjustable drop sprig that can be shoved out of the way when desired to prevent undesired knocking against and bending, as for example, when other craftsmen are working in the area.

A further object is to provide a sprig that saves considerable time and expense in the installation of a sprinkler system.

A further object is to provide means in such a sprig for catching sediment and the like.



A further object is generally to improve the design and construction of drop sprigs.

The means by which the foregoing and other objects of the present invention are accomplished and the manner of their accomplishment will be readily understood from the following specification upon reference to the accompanying drawings, in which:

FIG. 1 is a fragmentary view of an installed sprinkler system employing the drop sprig of the present invention.

FIG. 2 is an enlarged sectional view taken as on the line II—II of FIG. 1.

FIG. 3 is an enlarged fragmentary sectional view taken as on the line III—III of FIG. 1.

FIG. 4 is an enlarged fragmentary side elevational view of the upper end of the lower pipe.

Referring now to the drawings in which the various parts are indicated by numerals, FIG. 1 show a typical installation of the present invention wherein it will be seen one of the drop sprigs 11 of the present invention is shown connected to a horizontal pipe 13, which forms part of the sprinkler system and is installed in the building, not shown, for carrying water and the like. The numeral 15 designates the ceiling of one of the rooms of the building and, as will be seen, the ceiling 15 is spaced below pipe 13. The pipe 13 may be located below the permanent ceiling, not shown, or may be disposed in the ceiling. Although only one drop sprig 11 is shown in FIG. 1, it will be understood that it is contemplated that a plurality of such drop sprigs be connected to pipe 13 at desired points.

Each of drop sprigs 11 comprises an upper pipe 17 connected adjacent the upper end thereof to pipe 13 as by means of the usual T connection 19 interposed in pipe 13 with the upper pipe being joined to the depending branch of the T connection so that water is adapted to flow from pipe 13 into upper pipe 17. Upper pipe 17 is preferably flared outwardly and downwardly adjacent the upper end thereof as at 21 and extends to the upper end of the main cylindrical portion 23 of pipe 17.

The lower end of upper pipe 17 is open as at 25, and the upper end of a lower pipe 27, smaller in diameter than upper pipe 17, is telescopically received in the upper pipe through open lower end 25. A sprinkler head 29 of usual construction is attached to the lower end of lower pipe 27 so that when the sprinkler head is actuated in the usual manner into an open position as by the heat of a fire, the water is adapted to flow from pipe 13 into upper pipe 17, then into lower pipe 27 and out sprinkler head 29.

An annular groove 31 is provided in the exterior of lower pipe 27 adjacent the upper end thereof to provide an upwardly facing shoulder 33 against which a resilient annular gasket 35 is adapted to fit and to extend outwardly into sliding contact with the interior wall 37 of upper pipe 17. It is contemplated that resilient gasket 35 be in the form of a neoprene O-ring or the like so that a completely watertight seal is provided to prevent flow of water and the like between pipes 17, 27 and out the open end 25. It should be understood that resilient gasket 35 is not limited to the O-ring type mentioned above, but may be of other suitable types and shapes without departing from the spirit and scope of the present invention. It will be understood that the water pressure will urge gasket 35 against shoulder 33 and against the interior wall 37 so that as the water pressure increases the seal is enhanced. In addition, it will be understood that groove 31 keeps gasket 35 in place relative to lower pipe 27, as when the lower pipe is moved up and down relative to upper pipe 17.

A plurality of threaded holes 39 are provided through upper pipe 17 adjacent lower pipe 27 and each of the threaded holes receives a set screw 41 which engages lower pipe 27 to anchor the lower pipe 27 and upper pipe 17 in a fixed position relative to one another.

It will be understood that the process of installing drop sprig **11** is a simple matter and is accomplished as follows: First, the upper pipe **17** is connected into the pipe **13** by means heretofore described at the desired place. Next, an aperture **43** is made in ceiling **15**. Then, the lower pipe **27** is shoved upwardly through aperture **43** into upper pipe **17** until sprinkler head **29** is flush against ceiling **15**, as shown in FIG. 1. Finally the set screws **41** are tightened to hold the lower pipe **27** and sprinkler head **29** in place.

From the foregoing it will be understood that much time and effort are saved as compared with the prior means of installing drop sprigs since there is no necessity for measuring the distance from pipe **13** to ceiling **15**, and thus the steps of marking off the distance of the ceiling from pipe **13**, removing the sprigs, and threading the lower end thereof can be eliminated.

It will also be understood that the space between upper and lower pipes **17**, **27** which is above resilient gasket **35** will serve as a place for sediment and the like to collect which would otherwise clog the sprinkler head **29**. The sediment that collects in the above mentioned space can easily be removed by shutting off the water in the system and removing the lower pipe **27**. It will be understood that removal of the lower pipe **27** can be accomplished simply by loosening set screws **41** and withdrawing the lower pipe.

In installations where there is no acoustical ceiling **15**, and where the sprinkler head **29** is spaced below the ceiling, it is many times advantageous to be able to shove the sprinkler head **29** upwardly out of the way, as for example, when other craftsmen are working in the area and might otherwise knock against and bend the sprig **11**. With the present invention this can easily be accomplished simply by loosening set screws **41** and pushing upwardly on the lower pipe **27**. It will be understood that any adjustments or movements of sprinkler head **29** can be made while the water is still in the drop sprig **11** since the resilient gasket **35** provides a sliding seal between upper pipe **17** and lower pipe **27**. In addition, it will be understood that the lower pipe **27** may be rotated about a vertical axis to turn the sprinkler head **29** to the desired position.

Although the present invention has been described and illustrated with respect to a preferred embodiment thereof, it is to be understood that it is not to be so limited since changes and modifications may be made therein which are within the full intended scope of this invention as hereinafter claimed.

We claim:

**1.** In a fire sprinkler system of the wet system type including a conduit pipe for carrying water and the like and with said pipe being arranged above the ceiling panel of a room of a building, an adjustable drop sprig comprising an upper pipe connected adjacent the upper end thereof to said first mentioned pipe and depending therefrom, said upper pipe being open adjacent the lower end thereof, a lower pipe smaller in diameter than said upper pipe and having its upper end open and telescopically received in the lower end of said upper pipe, a valved sprinkler head connected to said lower pipe adjacent the lower end thereof, said sprinkler head including means responsive to heat for opening said head for passage of water therethrough, said lower pipe being rectilinearly movable relative to said upper pipe to position said sprinkler head at a desired position, said lower pipe having a shoulder adjacent the upper end thereof, sealing means fitted against said shoulder and extending outwardly into sliding contact with the interior of said upper pipe for sealing said upper and lower pipes against flow of water and the like therebetween and for catching sediment and the like, and means cooperating between said lower pipe and said upper pipe for holding said lower pipe at a selected fixed position relative to said upper pipe with said sprinkler head being disposed substantially at the undersurface of said ceiling panel of said room, said sprinkler head being normally in a closed disposition for holding water in the pipes and until said sprinkler head is actuated by a fire to open said sprinkler head.



**2.** In a fire sprinkler system of the wet system type including a pipe for carrying water and the like and with said pipe being arranged above the ceiling panel of a room of a building, and adjustable drop sprig comprising an upper pipe connected adjacent the upper end thereof to said first mentioned pipe and depending therefrom, said upper pipe being open adjacent the lower end thereof, a lower pipe smaller in diameter than said upper pipe and having its upper end open and telescopically received in the lower end of said upper pipe, a valved sprinkler head connected to said lower pipe adjacent the lower end thereof, said sprinkler head including means responsive to heat for opening said head for passage of water therethrough, said lower pipe being rectilinearly movable relative to said upper pipe to position said sprinkler head at a desired position, said lower pipe having a shoulder adjacent the upper end thereof, sealing means fitted against said shoulder and extending outwardly into sliding contact with the interior of said upper pipe for sealing said upper and lower pipes against flow of water and the like therebetween and for catching sediment and the like, said sealing means being resilient whereby said sealing means is adapted to be forced against said upper and lower pipes by an increase in the water pressure and the like to enhance the seal between said upper and lower pipes, and means cooperating between said lower pipe and said upper pipe for holding said lower pipe at a selected fixed position relative to said upper pipe with said sprinkler head being disposed substantially at the undersurface of said ceiling panel of said room.

**3.** In a fire sprinkler system of the wet system type including a pipe for carrying water and the like and with said pipe being arranged above the ceiling panel of a room of a building, an adjustable drop sprig comprising an upper pipe connected adjacent the upper end thereof to said first mentioned pipe and depending therefrom, said upper pipe being open adjacent the lower end thereof, a lower pipe smaller in diameter than said upper pipe and having its upper end open and telescopically received in the lower end of said upper pipe, a valved sprinkler head connected to said lower pipe adjacent the lower end thereof, said sprinkler head including means responsive to heat from a fire for opening said head for passage of water therethrough, said lower pipe being rectilinearly movable relative to said upper pipe to position said sprinkler head at a desired position, said lower pipe having a shoulder adjacent the upper end thereof, sealing means fitted against said shoulder and extending outwardly into sliding contact with the interior of said upper pipe for sealing said upper and lower pipes against flow of water and the like therebetween and for catching sediment and the like, said sealing means being resilient whereby said sealing means is adapted to be forced against said upper and lower pipes by an increase in the water pressure and the like to enhance the seal between said upper and lower pipes, at least one threaded hole extending through said lower pipe adjacent said upper pipe, and a set screw threadedly engaged in said hole and contacting said upper pipe to hold said lower pipe and said sprinkler head in a fixed position with said sprinkler head being disposed substantially at the undersurface of said ceiling panel of said room, said sprinkler head being normally in a closed disposition for holding water in the system until said sprinkler head is actuated by a fire to move said sprinkler head to an open disposition.

**4.** In a fire sprinkler system of the wet system type including a conduit pipe for carrying water and the like and with said pipe being arranged above the ceiling panel of a room of a building, an adjustable drop sprig comprising an upper pipe connected adjacent the upper end thereof to said first mentioned pipe and depending there-

from, said upper pipe being open adjacent the lower end thereof, a lower pipe smaller in diameter than said upper pipe and having its upper end open and telescopically received in the lower end of said upper pipe, a valved sprinkler head connected to said lower pipe adjacent the lower end thereof, said sprinkler head including means responsive to heat from a fire for opening said head for passage of water therethrough, said lower pipe being rectilinearly movable relative to said upper pipe to position said sprinkler head at a desired position, said lower pipe having an annular groove adjacent the upper end thereof, sealing means fitted into said annular groove and extending outwardly into sliding contact with the interior of said upper pipe for sealing said upper and lower pipes against flow of water and the like therebetween and for catching sediment and the like, said sealing means being resilient whereby said sealing means is adapted to be forced against said upper and lower pipes by an increase in the water pressure and the like to enhance the seal between said upper and lower pipes, at least one threaded hole extending through said lower pipe adjacent said upper pipe, and a set screw threadedly engaged in said hole and contacting said upper pipe to hold said lower pipe and said sprinkler head in a fixed position with said sprinkler head being disposed substantially at the undersurface of said ceiling panel of said room, said sprinkler head being normally in a closed disposition for holding water in the pipes of said system until said sprinkler head is actuated by a fire.

5. In a fire sprinkler system in a building with the sprinkler system including a substantially horizontally disposed water supply pipe arranged above the ceiling panel of a room of the building, a plurality of drop sprigs depending from said water supply pipe; each of said drop sprigs comprising a first cylindrical pipe disposed vertically, means connecting the upper end of said first pipe to said supply pipe for passage of water into said first pipe, a second cylindrical pipe disposed vertically, the outside diameter of said second pipe being smaller than the inside diameter of said first pipe, the upper end portion of said second pipe being telescopically fitted into the lower end portion of said first pipe, circular-seal of resilient material sealingly interposed between said first pipe and said second pipe for preventing passage of water between said first pipe and said second pipe, and a valved sprinkler head having means responsive to the heat of a fire for opening said head for passage of water therethrough, said sprinkler head being securely attached at the lower end portion thereof to said second pipe with said sprinkler head being positioned substantially at the undersurface of said ceiling panel of said room, said sprinkler head being disposed normally in a closed disposition for holding water in the fire sprinkler system until said sprinkler head is actuated by a fire and moved to an open disposition.

6. In a fire sprinkler system in a building with the sprinkler system including a substantially horizontally disposed water supply pipe arranged above the ceiling panel of a room of the building, a plurality of drop sprigs dependently secured from said water supply pipe; each of said drop sprigs comprising a first cylindrical pipe disposed vertically, said first pipe including an inside cylindrical surface and an outside cylindrical surface, means connecting the upper end of said first pipe to said supply pipe for passage of water into said first pipe, a second cylindrical pipe disposed vertically, said second pipe including a cylindrical inside surface and a cylindrical outside surface, said outside surface of said second pipe being smaller than said inside surface of said first pipe, the upper end portion of said second pipe being telescopically fitted into the lower end portion of said first pipe, an annular circumferentially formed groove provided in said outside surface of said second pipe, a circular seal of resilient material snugly fitted into said annular groove, said circular seal being interposedly disposed between said inside surface of said first pipe and said groove of said second pipe, said circular seal and said groove providing means for preventing passage of water between said first pipe and said second pipe, and a valved sprinkler head having means responsive to the heat from a fire for opening said head for passage of water therethrough, said sprinkler head being positioned substantially at the undersurface of said ceiling panel of said room, said valved sprinkler head being normally secured in a closed disposition for holding water in said sprinkler system and until said sprinkler head is actuated to an open disposition by the heat from the fire.



7. In a fire sprinkler system in a building with the sprinkler system including a substantially horizontally disposed water supply pipe arranged above the ceiling panel of a room of the building, a plurality of drop sprigs depending from said water supply pipe; each of said drop sprigs comprising a first cylindrical pipe disposed vertically, said first pipe including an inside cylindrical surface and an outside cylindrical surface, means connecting the upper end of said first pipe to said water supply pipe for passage of water into said first pipe, a second cylindrical pipe disposed vertically, said second pipe including a cylindrical inside surface and a cylindrical outside surface, said outside surface of said second pipe being smaller than said inside surface of said first pipe, the upper end portion of said second pipe being telescopically fitted into the lower end portion of said first pipe, an annular circumferentially disposed groove provided in said outside surface of said second pipe and adjacent the upper end portion thereof, a circular seal of resilient material snugly fitted in said annular groove, said circular seal being interposedly disposed between said inside surface of said first pipe and said groove of said second pipe, said circular seal preventing passage of water between said first pipe and said second pipe, a valved sprinkler head having means responsive to the heat of a fire for opening said head for passage of water therethrough, said sprinkler head being positioned substantially at the undersurface of said ceiling panel of said room, and means adjustably securing said second pipe at a selected position relative to said first pipe and for preventing telescopic movement of said first pipe relative to said second pipe, said valved sprinkler head being normally secured in a closed disposition for holding water in said fire sprinkler system until said sprinkler head is actuated to an open disposition by the heat of a fire.

8. The structure of claim 7 in which said means fixedly securing said second pipe at a selected position relative to said first pipe includes a threaded hole extending through said first pipe and a set screw threadedly engaged in said hole and contacting said second pipe.


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