No. 725,827. PATENTED APR. 21, 1903.

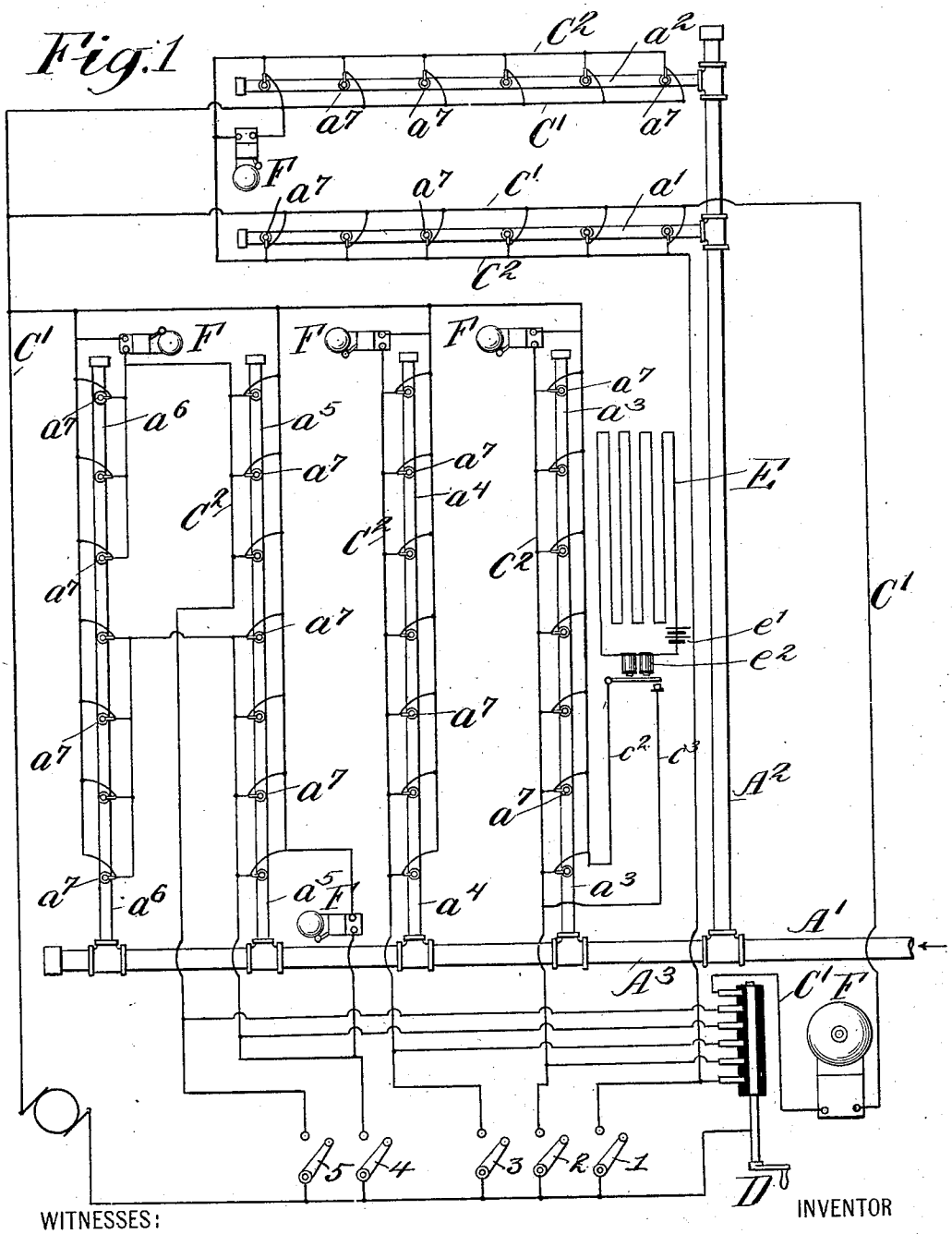
A. A. COWLES.

SPRINKLER APPARATUS.

APPLICATION FILED JAN. 20, 1902.

NO MODEL. 2 SHEETS—SHEET 1.

Fig. 1



WITNESSES:

Harry X. Goss.

Geo. C. Crane.

INVENTOR

Alfred A Cowles

BY

Dickerson, Brown & Ralgener

HIS ATTORNEYS

THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

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APPLICATION FILED JAN. 20, 1902.

NO MODEL. 2 SHEETS—SHEET 2.

Fig. 2,

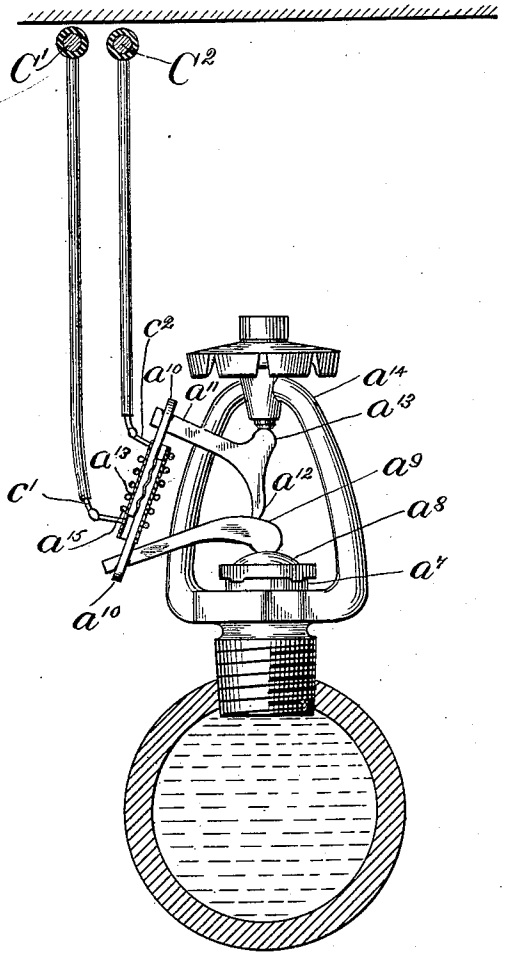


Fig. 4,

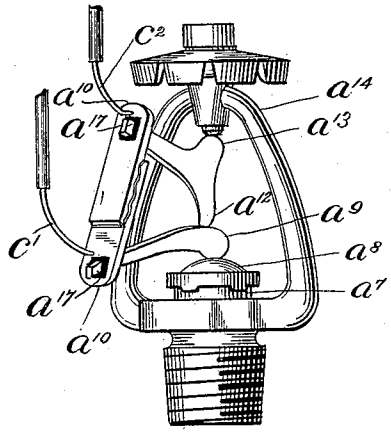
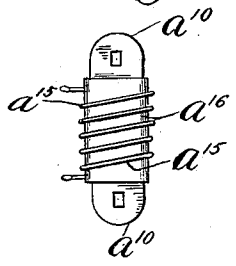


Fig. 3,



WITNESSES:

Harry Goss.

Geo. E. Bruce.

INVENTOR

Alfred A. Cowles.

BY

Dickerson, Brown & Baegner

HIS ATTORNEYS

THE NORRIS PETERS CO. PHOTO-LITHO., WASHINGTON, D. C.

UNITED STATES PATENT OFFICE.

ALFRED A. COWLES, OF NEW YORK, N. Y.

SPRINKLER APPARATUS.

SPECIFICATION forming part of Letters Patent No. 725,827, dated April 21, 1903.

Application filed January 20, 1902. Serial No. 90,431. (No model.)

To all whom it may concern:

Be it known that I, ALFRED A. COWLES, a citizen of the United States, residing in the borough of Manhattan, city, county, and State of New York, have invented certain new and useful Improvements in Sprinkler Apparatus, of which the following is a specification.

My improvement relates to sprinklers of the kind used for the protection of buildings against fire. The fluid employed for sprinkling may be water, the escape of which is directly controlled by a cap or indirectly controlled by a cap through an intermediate body of compressed air. The latter has been termed the "dry" system and the former the "wet" system. My improvement is intended for either of these systems and is not intended to be restricted in its application to either of them. In such sprinklers the caps are usually held in place by a material which will give way at a certain degree of heat—as, for instance, a fusible metal—solder or alloy—yielding at a predetermined heat which would be generated by a fire upon the premises to be protected by the sprinkler. As the fire only affects the sprinkler by heating the atmosphere up to the predetermined point, a certain time must elapse after the fire starts before the sprinkling will begin. Consequently the fire may make great headway before anything is done to arrest it. Sometimes fire gains such headway that the sprinklers have not the ability to extinguish it. Obviously a very little fluid applied at the beginning of a fire and only at the particular place needed would be sufficient to extinguish the flames, and it is therefore one object of my improvement to accomplish this.

Preferably my improvement will be embodied in a sprinkler in such a manner as not to interfere with the ordinary operation caused by the heating of the atmosphere from a fire, and in this connection I may state that I prefer to retain all the valuable devices of any of the existing sprinklers and to apply my improvement thereto for the purpose of securing for them greater advantages.

The apparatus embodying my improvement may be installed as a part of new sprinklers or employed as an adjunct of already existing sprinklers.

One feature of my improvement involves the employment of means enabling any person to operate a sprinkler at a number of points in the protected premises, so that it may be started near any point where a fire may originate and immediately after the starting of the fire without causing the sprinkler to operate at other points in the premises, where it would only have the effect of causing damage. This feature of my improvement adds to the efficiency of an ordinary sprinkler by enabling it to be put in operation without any delay by hand when the fire is discovered and without in any way interfering with its ordinary automatic operation. In many if not all cases this feature of my improvement may advantageously comprise an electric circuit extending from a point or points easily reached to the material, which will give way at a certain degree of heat, and there combined with means for producing the necessary heat to effect the release of sprinkler-caps.

Another feature of the improvement involves the employment of means distributed around the protected premises for automatically closing the electric circuits for producing the necessary heat to effect the release of sprinkler-caps. These means for automatically closing the electric circuits will also, preferably, be arranged in sections and may consist of wiring extending about all parts of the protected premises which are most likely to take fire and constituting a local circuit comprising a battery and electromagnet which will close the main electric circuit already referred to as employed for the purpose of causing sufficient heat for opening sprinklers, or the main circuit may comprise cables having wires which will be brought together by a certain heat to close the circuit, and these cables may be extended around the protected premises. Any equivalent means may be used.

My improvement also involves the division of a sprinkler apparatus into circuits or sections which may, for example, be fifty feet square, and which will therefore protect twenty-five hundred square feet of surface, and to so organize the entire sprinkler that each of these sections may be operated independently or separately or in succession or all together.

In the accompanying drawings, Figure 1 is a diagrammatic plan of one form of sprinkler apparatus embodying my improvement. Fig. 2 is a sectional elevation comprising parts of the same. Fig. 3 is an elevation of certain parts in Fig. 2. Fig. 4 is a view similar to Fig. 2, illustrating a modification.

Similar characters of reference designate corresponding parts in all the figures.

A′ designates a pipe for the passage of fire-extinguishing fluid, which will usually be water. A^2 A^3 are pipes leading therefrom.

a' a^2 are branch pipes leading from the pipe A^2. a^3 a^4 a^5 a^6 are similar branch pipes extending from the pipe A^3. Each one of these branch pipes, or any number of them together, may be regarded as constituting a sprinkler-section. A number of openings a^7 are provided in each of the pipes a' a^2 a^3 a^4 a^5 a^6. Each is closed by a cap a^8. I desire to remark that by the term "cap" I mean, broadly, a closing device of any suitable character. A trip normally secures the cap in place. As here shown, this strip consists of a lever a^9, having a bearing at one end upon the cap and engaged at the other end with a bar or plate of any suitable material a^{10}. The other end of this bar or plate a^{10} engages with one arm of a lever a^{11}, which has an arm a^{12}, engaging with the lever a^9, and an arm a^{13}, bearing upon a portion of the frame a^{14}. The bar or plate a^{10} may be of any suitable character. It may, for instance, be of a metal suitable for conducting electricity and so constituted as to fuse or melt at any desired heat, or it may be made in two parts with such a material intermediate or surrounding its two parts. When fusing or melting occurs, the lever a^9 will release the cap a^8 to permit the flow of the fire-extinguishing fluid. In Figs. 2 and 3 I have shown a bar or plate a^{10}, composed of two parts overlapping each other for a portion of their length and serrated or corrugated transversely throughout their overlapping portions. They are held together by intermediate solder which will fuse or melt at a predetermined heat. A resistance-coil a^{15} surrounds the two parts to generate heat for fusing or melting the solder. Any suitable resistance device or heating device other than a coil may be substituted for the coil. Suitable insulating material a^{16} is interposed between the bar or plate a^{10} and the resistance device, and it may be in any appropriate form. Wires c' c^2 connect with this resistance-coil or heating device and extend from main wires C′ C^2, which extend appropriately through the premises to be protected. Of course these wires should be insulated. It will be seen that they are in multiple arc for the various sprinkler-openings a^7.

In Fig. 4 I have shown a bar or plate a^{10}, composed of two parts united by a solder which will fuse or melt at a predetermined heat and directly connected in the electric circuit. In this instance the bar or plate a^{10} must be made of such electrical resistance that an electric current passing through it will fuse or melt the solder. Of course it must be insulated from the levers with which it connects if these levers are made of metal, and I have therefore shown eyelets a^{17}, of insulating material, for the purpose.

It will be seen that the wires C′ C^2 are extended around the premises to be protected, so as to correspond with the branch pipes a' a^2 a^3 a^4 a^5 a^6, and hence are divided into sections corresponding with the branch pipes. A main switch D serves to close all the branch circuits for the purpose of effecting the operation of the entire sprinkling apparatus. Other switches 1, 2, 3, 4, and 5 serve to effect the operation of the different sections of the apparatus separately or independently or in succession. All switches must be located so as to be easily reached for operation according to the exigencies. It is advantageous to have the separate sections controlled by separate switches, so that only one portion or any number of portions of the protected premises may be sprinkled without causing injury of others where there is no need of sprinkling. It will of course be advantageous to letter or number the switches, so that they may be readily distinguished if they are located close together. This expedient may, however, be omitted if they should be located near to the sections which they control. Preferably the switches will be inclosed in boxes having glass fronts which can be kept locked: The glass may be broken to afford instant access to a switch. Any visual or audible signal may be employed in connection with the electric circuits. I have shown a number of electromagnetic bells F thus employed.

My improvement comprises a resistance coil or device for heating the material which will give way at a certain degree of heat to release sprinklers, or that material itself may be made to constitute a resistance device for generating sufficient heat to melt or fuse it, or a gas-jet or other small fire or steam or hot-water jet or current may be started by the closing of an electric circuit close to the said material, which has to be fused or melted to release sprinklers. Obviously in a new apparatus where the expense of a separate sprinkler-opening would not be objectionable an electromagnet might be employed for opening sprinklers upon the closure of the main electric circuit by heat at points distant from the sprinklers. The various means for heating the said material, which is to be fused or melted, may advantageously be arranged in multiple arc. The necessary electric current may be provided by primary or secondary batteries or by a dynamo, or may be taken from an electric-lighting system, which is common to a number of buildings.

Wherever in my invention the opening of an electric circuit would answer the same

purpose as the closing of an electric circuit, I desire to include it as part of my invention.

In Fig. 1 I have illustrated automatic means comprising electric devices for closing an electric circuit for causing the opening of sprinklers.

E designates fine wiring, such as is commonly used for partitions and similar structures. It may be made so as to fuse or melt at any predetermined heat. I have shown it as constituting a local circuit comprising an electric battery e' and an electromagnet e^2. Normally the electromagnet will attract its armature and leave separated the wires c^3 c^4, extending from the circuit-wires C' C^2. The fusing or melting of the wiring E will open this local circuit and cause the armature of the magnet e^2 to connect the wires c^3 c^4.

What I claim as new, and desire to secure by Letters Patent, is—

1. The combination with a sprinkler apparatus divided into a number of sections having in each section a plurality of sprinklers, of means for automatically operating the different sprinklers separately at a certain degree of heat, and independent means for manually operating all the sprinklers in a given section, for substantially the purposes set forth.

2. The combination with a sprinkler apparatus divided into a number of electrical circuits or sections, of electrical means for opening the sprinklers of different circuits or sections at will, and fire-operated means for opening the individual sprinklers, for substantially the purposes set forth.

3. The combination with a sprinkler apparatus divided into a number of circuits or sections, of electrical means for automatically opening different sections separately or together.

4. The combination with a sprinkler apparatus divided into a number of circuits or sections having a number of orifices in each, of electrical means for said circuits or sections for opening the orifices in each or in several of the said circuits or sections, for substantially the purposes set forth.

5. The combination with a sprinkler apparatus divided into a number of circuits or sections, of means for automatically opening different sections separately or together.

6. The combination with a sprinkler apparatus divided into a number of sections, of means for automatically opening different sections separately, and independent means for manually opening the same together.

7. The combination with a sprinkler apparatus divided into a number of sections, of electrical means for automatically opening the different sections separately, and independent means for manually opening the same together.

8. The combination with a sprinkler apparatus divided into a number of sections each having orifices, of separate means for opening each said orifice, independent means for opening together all the orifices in each section; and independent means for opening together all the orifices in a number of sections.

9. The combination with a sprinkler apparatus divided into a number of sections each having orifices, of separate means for opening each said orifice; independent electrical means for opening together all the orifices in each section; and independent means for opening together all the orifices in a number of sections.

10. The combination with a sprinkler apparatus, divided into a number of sections each having orifices, of separate means for opening each said orifice; independent means for opening together all the orifices in each section; and independent electrical means for opening together all the orifices in a number of sections.

11. The combination with a sprinkler apparatus divided into a number of sections each having orifices, of separate means for opening each said orifice; independent electrical means for opening together all the orifices in each section; and independent electrical means for opening all the orifices in a number of sections.

12. The combination with a sprinkler apparatus divided into a number of sections each having orifices, of separate means for automatically opening each of said orifices; independent manually-operated means for opening together all the orifices in each section; independent means for automatically opening all the orifices in a number of sections; and independent manually-operated means for opening together all the orifices in a number of sections.

13. The combination with a sprinkler apparatus having a number of sections each section comprising a number of orifices, of means for closing each orifice comprising a part adapted to fuse automatically at a certain temperature; independent and manually-operated means for passing an electric current through all said parts in a given section to fuse the same; and independent automatic means for passing an electric current through and to fuse all said parts in a number of sections.

14. The combination with a sprinkler apparatus having a number of sections each section comprising a number of orifices, of means for closing each orifice comprising a part adapted to fuse automatically at a certain temperature; independent and manually-operated means for passing an electric current through all said parts in a given section to fuse the same; and independent automatic means for passing an electric current through and to fuse all said parts in a number of sections; and independent and manually-operated means adapted to pass an electric current through and to fuse all said parts in a number of sections.

15. The combination with a sprinkler apparatus divided into a number of sections each

section comprising a number of orifices, of means for closing each orifice comprising a part adapted to fuse automatically at a certain temperature; an electric generator, means for partially connecting electrically said generator with each and all of said parts; independent means and manually-operated means for completing the electrical connection between said generator and all of said parts in a given section; independent automatic means for completing the electrical connection between said generator and all said parts in a number of sections.

16. The combination with a sprinkler apparatus divided into a number of sections each section comprising a number of orifices, of means for closing each orifice comprising a part adapted to fuse automatically at a certain temperature; an electric generator, means for partially connecting electrically said generator with each and all of said parts; independent means and manually-operated means for completing the electrical connection between said generator and all of said parts in a given section; independent automatic means for completing the electrical connection between said generator and all said parts in a number of sections; and independent and manually-operated means for completing the electric circuit between said generator and all of said parts in a number of sections.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

ALFRED A. COWLES.

Witnesses:
K. G. LE ARD,
GEO. E. CRUSE.