

(No Model.)

2 Sheets—Sheet 1.

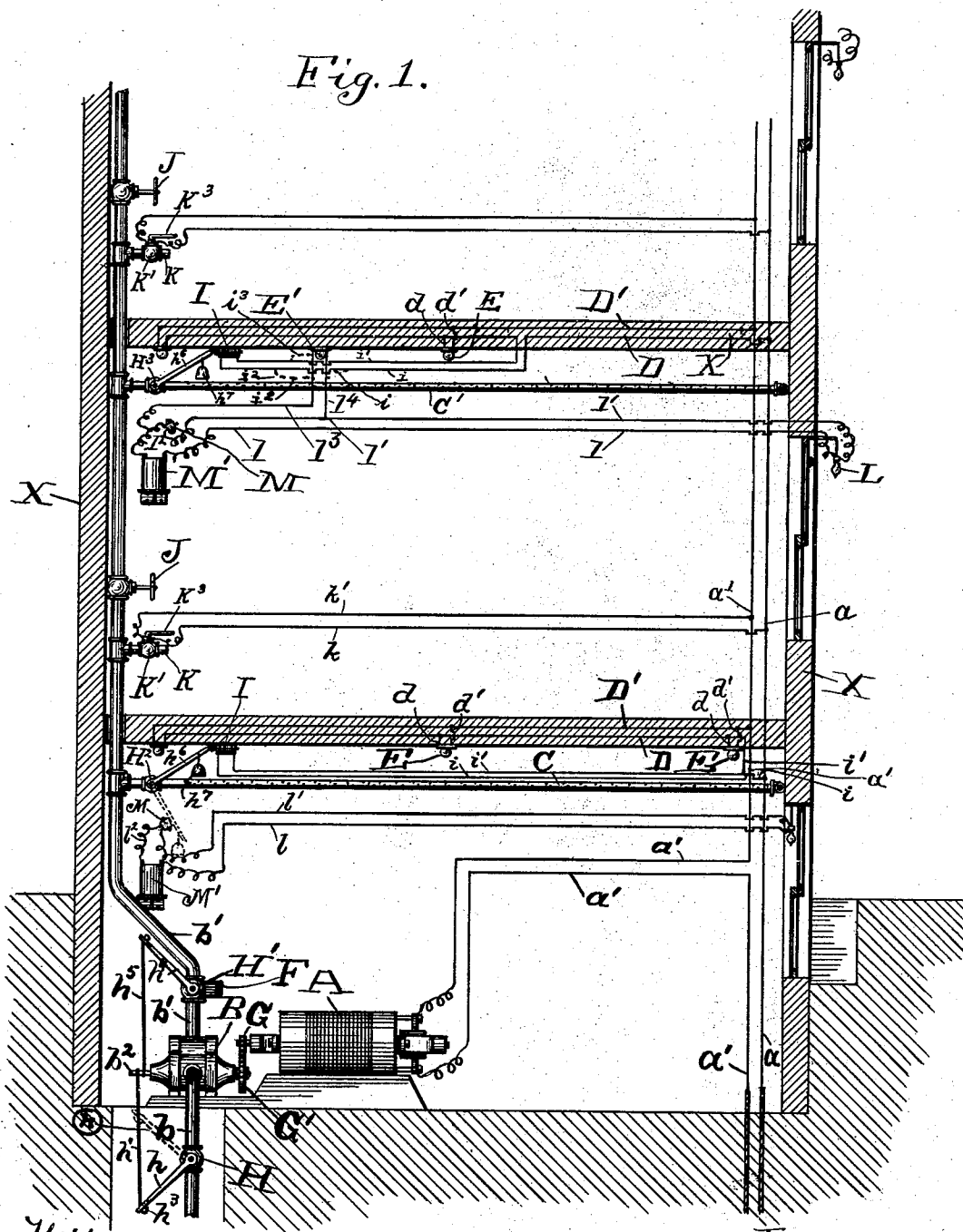
J. S. KIEHL.

AUTOMATIC SPRINKLER AND FIRE INDICATOR.

No. 506,700.

Patented Oct. 17, 1893.

Fig. 1.



Witnesses:

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Fig. 2.

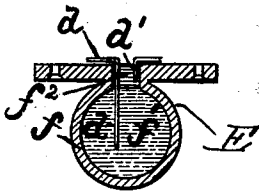


Fig. 3

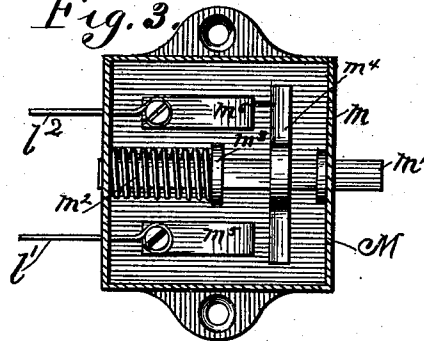


Fig. 4.

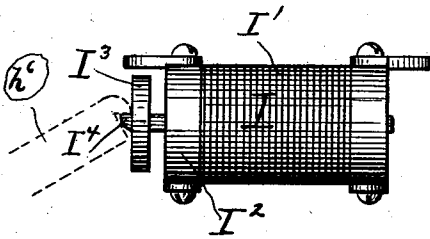


Fig. 5.

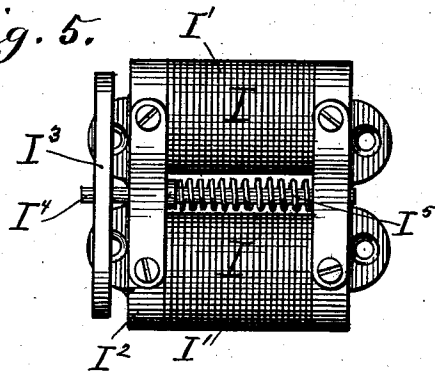


Fig. 6.

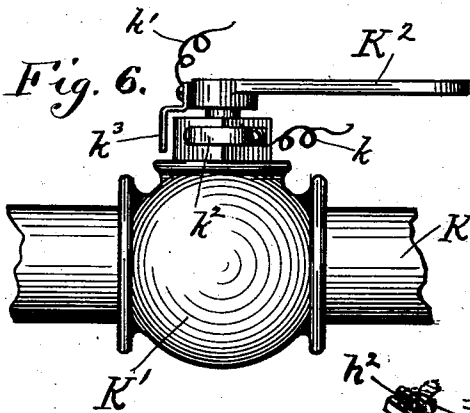


Fig. 7.

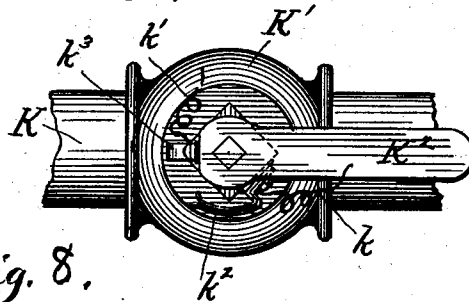
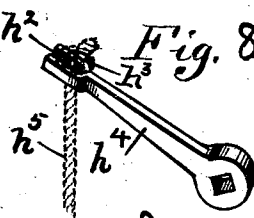


Fig. 8.



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UNITED STATES PATENT OFFICE.

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AUTOMATIC SPRINKLER AND FIRE-INDICATOR.

SPECIFICATION forming part of Letters Patent No. 506,700, dated October 17, 1893.

Application filed October 19, 1892. Serial No. 449,416. (No model.)

To all whom it may concern:

Be it known that I, JOSEPH SILAS KIEHL, a resident of Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Automatic Sprinklers and Fire-Indicators, of which the following, when taken in connection with the drawings accompanying and forming a part hereof, is a full and complete description sufficient to enable those skilled in the art to understand, make, and use the same.

My invention relates to the class of devices designed in case of fire in the building or room wherein the same is located, to automatically sprinkle or throw water within and about such building or room.

The purposes of my invention are to obtain a device whereby the piping in the building through which water is conveyed to the place where, when in use, such water is sprinkled from it, shall not contain water except at or about the time the sprinkling thereof is being effected; to provide a device whereby, in case of fire in any room or rooms of the building wherein the device is placed, water shall be automatically supplied to the pipes and sprinkled therefrom within and about such room and such room only; to obtain a device whereby, when water is being so sprinkled within and about any room of the building wherein the device is placed, the room in such building in which water is so being sprinkled shall be designated or indicated to firemen and others outside of the building by a suitable signal; and further to provide in case of any possible failure of any part of the device used for sprinkling purposes, that the signal shall be given, to provide an independent mode of producing such signal to designate the particular room of the building in which fire obtains.

To effect the several purposes sought by me, I use a pump driven, preferably, by an electric motor, the feed pipe of the pump being connected with a suitable water supply and the discharge pipe thereof with a piping extending throughout the building, with suitable valves, hereinafter described, placed in the piping to control the discharge of the water forced therethrough by the pump; automatic electrical indicators and switches for starting the motor, used in actuating the

pump, and for turning the proper valve in the piping to sprinkle water in the room where the fire obtains; and for making the desired signal, (such signal being by me a common incandescent electric light, the bulb whereof is preferably composed of red glass.)

In the drawings referred to as illustrating my invention: Figure 1, is a sectional view of a building showing the device embodying my invention placed therein; Fig. 2, a sectional view of an automatic thermo-electric circuit closer; Fig. 3, an enlarged view of a circuit closer actuated by the lever of the valve admitting water into the sprinkling pipes, when such lever is turned so that water can pass through the valve into such sprinkling pipe; Fig. 4, a side elevation of an electro-magnetic catch for holding the lever of the valve admitting air into the sprinkling pipe in position so that the valve is closed; such electro-magnetic catch being adapted to release the lever when an electric current extends through the coils thereof; Fig. 5, a top plan view of the electro-magnetic catch illustrated in Fig. 4; Fig. 6, a side elevation of a valve employed by me as an element of my device adapted to be turned by any person, as a watchman or workman, so as to allow water to pass through it, and when so turned, to automatically start the motor and pump thereby providing water to pass through the valve; Fig. 7, a top plan view of the valve illustrated in Fig. 6; and Fig. 8, a perspective view of a lever actuated by the movement of the pump, such lever forming the handle of an ordinary valve, which may be placed in the main pipe extending from the water supply to the pump, or in the pipe extending from the pump to the several distributing pipes or in both, as preferred.

The same letter of reference is used to indicate a given part where more than one view thereof is shown in the several figures of the drawings.

X, is the building in which the device embodying my invention is placed.

A, is an electric motor.

a, a', are, respectively, the wires forming the main or line circuit on which the electric current extends, whereby the motor A is actuated, when such circuit is closed.

B, is a pump.

b , is a pipe extending from the pump B to a suitable water supply.

b' , is a pipe extending from the pump B to the distributing pipes in the building; and C, and C', are such distributing pipes.

D, D', are wires extending around the respective rooms of the building from wires a , a' , respectively. From wires D, D', respectively, the terminal wires d , d' , extend to the thermo-circuit-closers E, E, respectively. Thermo-circuit closer E, (as well as thermo-circuit closer E' hereinafter referred to,) consists of glass bulb f , having therein mercury f' , into which mercury the terminal wire d extends, such glass bulb having the neck f^2 in which neck the terminal d' extends to a short distance above the level of the mercury f' ; whereby when the mercury f' is expanded, as by heat, electrical connection is made from wire d through mercury f' to wire d' , (wire d' by the expansion of the mercury f' becoming immersed therein.) When the thermo-circuit closer E is closed as described, the circuit consisting of wires a , D, D', and a' , with terminals d , d' , is closed and an electrical current from any suitable source of supply as a dynamo, will then extend thereover through the motor A, which will be thereby actuated. The motor A will then actuate the pump and thereby supply water to pipe b' and distributing pipes C, C', or to one thereof; such supply and distribution of water being controlled and regulated by the devices about to be described.

F, is a drip pipe in pipe b' , through which when the valve thereof, (which will be hereinafter described,) is open, water contained in the pipe b' above such drip pipe and if any, in the distributing pipes C, may run therefrom leaving such pipes dry.

Motor A is connected to the pump B, (such pump being preferably a rotary pump when an electric motor is used as a driver,) by means of the gearing G located on the driving shaft of motor A, intermeshing with gearing G' on the driving shaft of pump B. So that the motor A need not be started, under a load, as it is termed, the pump B is practically empty of water, when not in use, and in order that the water may not extend from the source of supply thereof through pipe b , when such source of supply is higher than pump B, as where the water main of a city supply is connected therewith, I provide the valve H actuated by the lever h , in pipe b , such lever h having extending therefrom to the shaft of the pump B, cord h' . Lever h has at the outer end thereof fork h^2 through which fork cord h' extends. Cord h' has, at the end thereof adjacent to lever h , the button h^3 , the other end of such cord being attached to the rotative shaft b^2 of pump B. By inspection of Fig. 1, it will be seen that when the shaft b^2 of pump B is rotated by the motor A, the cord h' will be wound around shaft b^2 and lever h thereby moved so that valve H will be

opened, (it being understood that such valve is closed when lever h is in the position illustrated by full lines, and open when the lever h has been brought into or about the position indicated by dotted lines,) and that at such time the button h^3 will be drawn out of the slot h^2 of lever h , and shaft b^2 may continue to rotate, whirling such button around it. H', is a valve in pipe b' actuated in like manner by means of lever h^4 thereof and cord h^5 extending around shaft b^2 . Valve H' is, when in the position illustrated by full lines in Fig. 1, open into drip pipe F hereinbefore referred to, and when drawn down by cord h^5 , so that the button on cord h^5 may slip off the lever h^4 , closed to the drip pipe F and opened in pipe b' so that water may ascend in such pipe.

To distribute the water forced through the pipe b' by pump B, (when such pump is actuated by motor A, in the manner last described,) into the room or rooms of the building wherein a fire obtains, I provide the distributing pipes, or sprinkling pipes C, C', as hereinbefore stated, such pipes being perforated, and having therein, respectively, valves H², H³. These valves H², H³, are actuated by lever h^6 having thereon weights h^7 , the valve being closed when such levers h^6 are in the position illustrated by full lines in Fig. 1, and open when such levers are in the position illustrated by the dotted lines in Fig. 1. To maintain the levers h^6 in the position wherein the valves H², H³, respectively, are closed, I provide the electro-magnetic catch I. This catch I is an ordinary electro-magnetic catch consisting of the coils I', I', electro-magnet I², armature I³, projection I⁴ and spring I⁵. Spring I⁵ tends to hold the armature I³ away from electro-magnet I². Projection I⁴, when the armature I³ is not drawn toward electro-magnet I², is adapted to engage with lever h^6 and hold it together with weight h^7 in the position illustrated in Fig. 1.

i , i , are wires extending from electro-magnetic catch I to the circuit over which the current extends actuating the motor, or if preferred, to a secondary circuit wherein is placed an automatic thermo-circuit closer. Where the electro-magnet I is actuated by the same current actuating the motor A, the electrical resistance of the coils I', I', is commensurate with the electrical resistance of the motor A, so that the armature I³ will be actuated by the passage of a current there-through sufficient to actuate the motor A, while at the same time, such coils will permit the passage therethrough of a current having sufficient ampereage to actuate the motor A when such motor is driving the pump B. Where the electro-magnetic catch I is to be actuated by a secondary current the wires i , i' , are disconnected from the main circuit and connected to a circuit in which is placed a suitable electrical generator, as a storage battery, and the dotted wires i^2 , i^3 , in-

dicating a means of connecting such wires to such a circuit as hereinafter fully described.

To provide means, whereby at any time water may be used through a hose on any floor, without the use of the distribution pipes C, C', hereinbefore described, there may be placed in the pipe b', valves J, J, by which water can be shut off from ascending in such pipe to the horizontal sprinkling pipes thereover; and branch pipe K, to which the hose may be attached.

K', is a valve in pipe K.

In order that water may be supplied, when valve K' is turned, I extend from the wires a, a', respectively, wires k, k', ending in the terminals k², k³, respectively. By the turning of the lever K² of valve K' one quarter round from the position in which it is illustrated in Figs. 1, 6 and 7, (such being the closed position of the valve,) to an open position, terminals k², k³, will come in contact and the circuit thereby established, whereby the motor A will be actuated.

L, is a signal light; l, l' being the wires whereon the current extends illuminating the lamp.

I have shown in Fig. 1, two ways of establishing the circuit, one of such ways is by means of the terminal M actuated by the lever h⁶, and the other by means of the thermo-circuit closer E' constructed and actuated in the same manner as is the thermo-circuit closer E hereinbefore described. M', is a storage battery. When the circuits l, l' are closed by the terminal M an electric current extends from the battery M' over wire l² to terminal M, from thence from wire l' to the light L, from thence over the wire l back to the storage battery M'. When the signal light L is illuminated by establishing the circuit through thermo-circuit closer E', the circuit extends from the storage battery M' over wires l² and l³ to thermo-circuit closer E', through such thermo-circuit closer to and over wire l⁴ to wire l', from thence to light L, and from thence over wire l to the storage battery M'.

The dotted wires i', i², hereinbefore referred to as connecting the circuit i, i', with a circuit wherein an independent electric generator is used to the one actuating the motor A, extend from wires i, i², respectively, to the wire l³, such wire l³ being cut between the points thereon where wires i², i³, respectively, are joined thereto. When so arranged, when the circuit whereon the current extends which illuminates the light L, is closed by the thermo-electric switch E', the current will extend from the storage battery M' or other electric generator substituted therefor over wires l², l³, to wire i² from thence to wire i, and from thence through the coils of magnet I, from thence over wire i' to wire i³, and over such wire i³ back to wire l, from thence through the thermo-electric closer E', through such thermo-electric closer, and from thence over

wires l⁴ and l' to the lamp L, and from thence from wire l to storage battery M'.

The terminal M hereinbefore referred to, is well illustrated in Fig. 3, of the drawing, and consists of the casing m, bolt m', having spring m² mounted thereon, one end of such spring abutting against the casing m, and the other against the collar m³, rigidly secured to bolt m', electrical conductors m⁴ also rigidly secured on bolt m', and terminals m⁵ and m⁶ to which are secured wires l² and l³, respectively. When the lever h⁶ is turned by the weight h⁷ thereon in the manner hereinbefore described, so that the end thereof shall come in contact with the outer end of the bolt m', electrical conductor m⁴ is pressed downward in contact with terminals m⁵, m⁶ and the circuit is completed.

Having thus described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. In an automatic sprinkler and fire indicator, a pump, a motor to actuate the pump, a pipe extending from the pump to a water supply, a pipe extending from the pump to the several rooms of a building, distributing pipes extending from the last named pipe, a thermo-circuit closer located in such building and wires extending from an electrical generator to the thermo-circuit closer and to the motor actuating the pump, whereby when the circuit formed by such wires, and thermo-circuit-closer is closed, the motor and pump will be actuated and water will be forced through the pipe from the pump and through the distributing pipes; substantially as described.

2. In an automatic sprinkler and fire indicator, a pump, a motor to actuate the pump, a pipe extending from the pump to a water supply, a valve in such pipe whereof the arm is connected to a movable part of the pump, a pipe extending from the pump to the several rooms of a building, distributing pipes extending from the last named pipe, a thermo-circuit-closer located in such building; and wires extending from an electrical generator to the thermo-circuit closer and to the motor actuating the pump, whereby when the circuit formed by such wires, and thermo-circuit-closer is closed, the motor and pump will be actuated, and water will be admitted to the pump from the pipe extending to the water supply and forced through the pipe from the pump and through the distributing pipes; substantially as described.

3. In an automatic sprinkler and fire indicator, the combination of a pump, a motor engaging with and adapted to actuate the pump, a pipe extending from the pump to a water supply, a pipe extending from such pump to the different rooms of a building, distributing pipes extending from the last named pipe, a valve in each of the distributing pipes, the lever whereof is weighted and thereby adapted to automatically open such

valve, an electro-magnet the armature whereof is adapted to lock the weighted lever so that the valve thereof is closed, wires extending from an electrical generator to the motor and to the several rooms of the building, thermo-circuit closers interposed in the circuit formed by such wires, with the electro-magnet locking the lever of the respective valves in the distributing pipes also interposed in such circuit, whereby, when the circuit is closed by the thermo-circuit closer an electric current will extend over such circuit to such electro-magnet and to such motor, and water will be thereby forced through the pump and to and through the distributing pipe in the room wherein is located the thermo-circuit-closer the closing whereof completes the circuit whereby the motor is actuated; substantially as described.

4. In an automatic sprinkler and fire indicator, the combination of a pump, a motor engaging with and adapted to actuate the pump, a pipe extending from the pump to a water supply, a valve in such pipe whereof the arm is connected to a movable part of the pump, a pipe extending from such pump to the different rooms of a building, distributing pipes extending from the last named pipe, a valve in each of the distributing pipes, the lever whereof is weighted and thereby adapted to automatically open such valve, an electro-magnet the armature whereof is adapted to lock the weighted lever so that the valve thereof is closed, wires extending from an electrical generator to the motor and to the several rooms of the building, thermo-circuit closers interposed in the circuit formed by such wires, with the electro-magnet locking the lever of the valve in the distributing pipes open also interposed in such circuit, whereby, when the circuit is closed by the thermo-circuit closer an electric current will extend over such circuit to such electro-magnet and to such motor and water will be thereby admitted to the pump from the pipe extending to the water supply and forced through the pump and to and through the distributing pipe in the room wherein is located the thermo-circuit closer the closing whereof completes the circuit whereby the motor is actuated; substantially as described.

5. In an automatic sprinkler and fire indicator, the combination of a pump, a motor engaging with and adapted to actuate the pump, a pipe extending therefrom to a water supply and a pipe extending therefrom to the different rooms of a building, a valve in each of the distributing pipes, the lever whereof is weighted and thereby adapted to automatically open such valve, an electro-magnet the armature whereof is adapted to lock the weighted lever so that the valve thereof is closed, wires extending from an electrical generator to the motor and to the several rooms of the building, thermo-circuit closers interposed in the circuit forming such wires, with

the electro-magnet locking the lever of the valve in the distributing pipes open also interposed in such circuit, an electrical signal, in the circuit whereof is placed a terminal closed by the movement of the lever of the valve in the distributing pipes when the same is released, whereby when the circuit is closed by the thermo-circuit closer, an electric current will extend over such circuit to such electro-magnet and to such motor, and water will be thereby forced through the pump and to and through the distributing pipe in the room wherein is located the thermo-circuit closer, the closing whereof completes the circuit whereby the motor is actuated and a signal will be automatically exhibited; substantially as described.

6. In an automatic sprinkler and fire indicator, a pump, a motor to actuate the pump, a pipe extending from the pump to a water supply, a valve in such pipe whereof the arm is connected to a movable part of the pump, a pipe extending from the pump to the several rooms of a building, wires extending from an electrical generator throughout the rooms of the building and to the motor, a hose pipe located on the pipe extending from the pump to the distributing pipes, a valve in such hose pipe, electric terminals on such valve, wires extending from such terminals to the wires forming the circuit whereon the current extends actuating the motor and such terminals on the valve being closed by the opening of the valve; whereby when such valve is actuated a current will extend over the circuit thereof to the motor and water will be supplied to the hose; substantially as described.

7. In an automatic sprinkler and fire indicator, the combination of a pump, a motor engaging with and adapted to actuate the pump, a pipe extending from the pump to a water supply, a pipe extending from such pump to the different rooms of a building, distributing pipes extending from the last named pipe, a valve in each of the distributing pipes, the lever whereof is weighted and thereby adapted to automatically open such valve, an electro-magnet the armature whereof is adapted to lock the weighted lever so that the valve thereof is closed, wires extending from an electrical generator to the motor and to the several rooms of the building, thermo-circuit-closers interposed in the circuit formed by such wires, with the electro-magnet locking the lever of the valve in the distributing pipes open also interposed in such circuit, a hose pipe located on the pipe extending from the pump to the distributing pipes, a valve in such hose pipe, electric terminals on such valve, wires extending from such terminals to the wires forming the circuit whereon the current extends actuating the motor and such terminals on the valve being closed by the opening of the valve, valves interposed in the pipe from the pump to the distributing pipes between such hose pipe and such distributing pipes in the re-

spective rooms, whereby when the last named valve is closed and the valve in the hose pipe is opened, an electric current will extend over the circuit thereof to the motor and water will be supplied to the hose; substantially as described.

8. In an automatic sprinkler and fire indicator, an electric signal, wires extending there-

from to an electric generator, and a thermo electric circuit closer interposed in the circuit so formed by such wires, substantially as described.

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