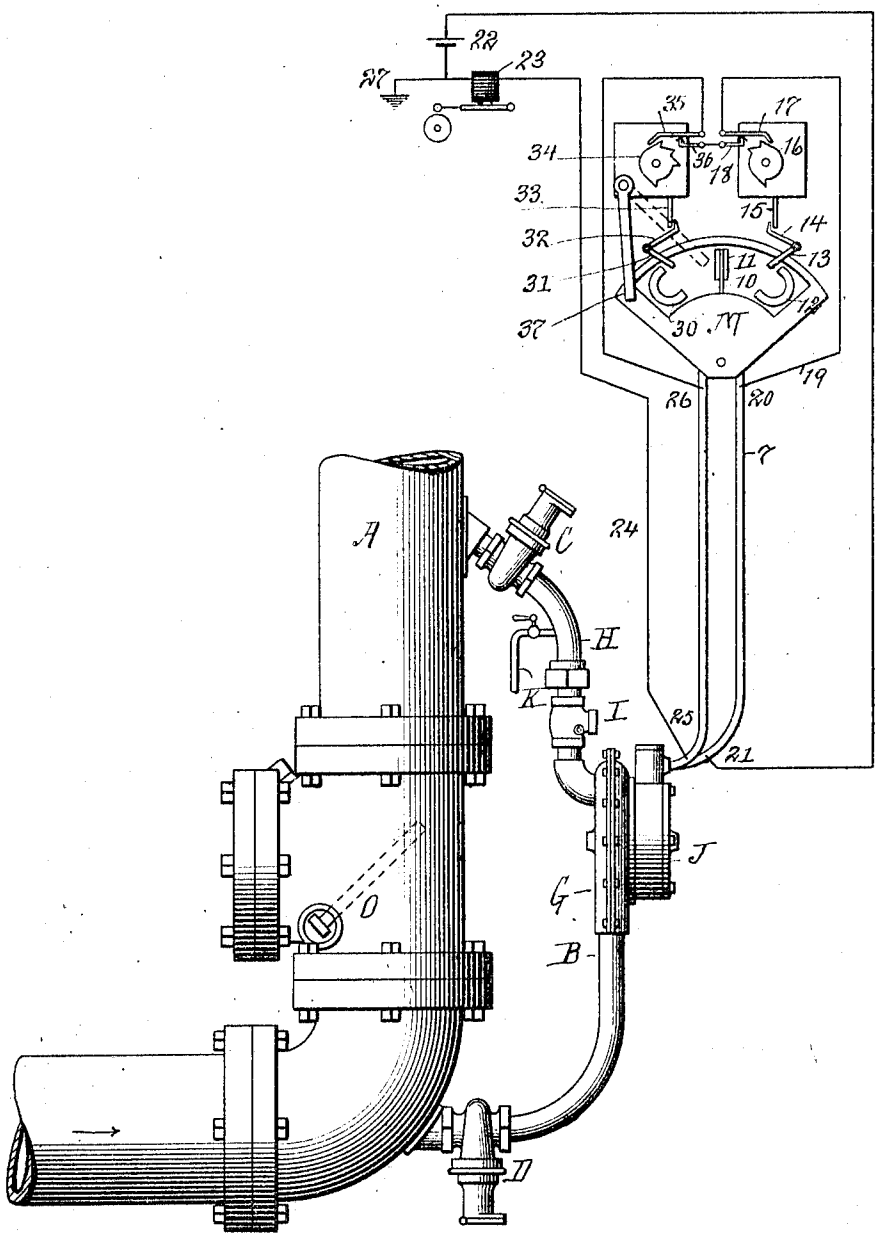
A. GOLDSTEIN.

SPRINKLER ALARM SYSTEM.

APPLICATION FILED DEC. 3, 1910.

988,768. Patented Apr. 4, 1911.



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UNITED STATES PATENT OFFICE.

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SPRINKLER ALARM SYSTEM.

988,768. Specification of Letters Patent. Patented Apr. 4, 1911.

Application filed December 3, 1910. Serial No. 595,353.

To all whom it may concern:

Be it known that I, ALBERT GOLDSTEIN, a citizen of the United States, residing at New York, in the county of New York and State of New York, have invented a certain new and useful Improvement in Sprinkler Alarm Systems, of which the following is a specification.

In an application for Letters Patent, Serial No. 555,131, filed by myself and Henry F. Blackwell April 13, 1910, there is set forth an alarm operated by the flow in a sprinkler system supply pipe, which gives warning of undue escape of water from the system; such, for example, as may happen after a fire in the building has been extinguished, with resulting drenching of the premises and consequent damage by water, sometimes in excess of that caused by the fire itself.

My present invention is an improvement upon the aforesaid device, in that it keeps the apparatus always under test, so that the alarm will not only give warning of the water escape aforesaid, but will also operate when there is a failure in the apparatus, or where a stoppage or obstruction occurs in the supply pipe, thus insuring the maintenance of the system in proper working condition.

The accompanying drawing is an elevation of a part of a main water supply conduit leading to a sprinkler system, to which conduit my apparatus is shown applied.

A is the main supply pipe, in which the water current moves in the direction of the arrow. O is a check valve in said pipe.

B is a by-pass, having controlling plugs C, D. In the by-pass is a casing G, in which is a water wheel of any suitable construction to be rotated by the water flow, which flow leaves the casing by the pipe H, in which is a check valve at I. On the side of the casing G is a casing J, in which is an electrical generator, the rotary member of which is carried on the shaft of the water wheel. In the segmental box M is a pivoted coil disposed in the field of a fixed coil, and carrying on an arm 10 the armature 11 of magnet 12. Entering box M is an arm 13 of a pivoted bell crank lever, the other arm 14 of which is hooked to form a detent for the pallet tail 15 of the actuating mechanism of a break wheel 16. Said mechanism may be of any suitable construction, including, for example, a wound spring, which, when released by the freeing of the pallet tail 15 from the detent 14, causes the wheel 16 to rotate and so make and break circuit between its spring brush 17 and contact 18, by which means an electric bell 23, energized by battery 22 and grounded at 27, is operated.

All of the foregoing parts are set forth in the aforesaid joint application, in which also the preferable construction of the generator and of the coils which control arm 10 are fully described.

My present improvement comprises additional devices, as follows: The magnet 12 is located at the end of the path of vibration of arm 10, and at the opposite end is disposed another and similar permanent magnet 30. In front of magnet 30 is disposed one arm 31 of a bell crank lever, the other arm 32 of which forms a detent for the pallet tail 33 of the actuating mechanism of a break wheel 34. Said mechanism may, as before, be a wound spring, which, when released by the freeing of the pallet tail 33 from the detent 32, causes the wheel 34 to make and break circuit between its spring brush 35 and contact 36. On the winding shaft of break wheel 34 is an arm 37, and in by-pass B is a valve-controlled outlet duct K, the purpose of which arm and duct will be explained farther on.

The circuit is as follows: from brush 17, by wire 19, which enters tube 7, through the wall thereof at 20, and leaves said tube at 21, to battery 22, bell magnet 23, wire 24, which enters tube 7, through the wall thereof at 25, and leaves said tube at 26, to spring brush 35, contact 36, contact 18, and so to brush 17.

The operation of the device is as follows: The duct K is normally open so as to permit the escape of a small amount of water on the delivery side of the water wheel in casing G. This insures a constant slow rotation of said wheel and a corresponding supply of current to the coils in box M. The adjustment of the coils is to be such as that, so long as this current is maintained, the arm 10 will assume a middle position, as shown in the drawing. If, on the inlet side of duct K, the supply pipe to the sprinkler system becomes obstructed, then there will be no water flow through the casing B, and hence no motion of the water wheel and no current

to box M. Similarly, if the water wheel is stopped by any cause, no current will flow. The usual retracting spring connected to arm 10 will then draw said arm to the left, into the field of magnet 30, and in so moving, said arm will trip the detent 32 and free break wheel 34, which in rotating will send a signal to line. During the rotation of wheel 34, the arm 37 is turned by the winding shaft to the position indicated by dotted lines, and in so moving it meets armature 11, moves it from the field of magnet 30 and restores said armature and arm 10 to normal middle position. In case of flow from the sprinklers, or from any part of the system beyond the duct K, the speed of the water wheel is increased, and the stronger current generated swings the arm 10 into the field of magnet 12. This magnet then attracts armature 11 to operate the bell crank lever and release the break wheel 16, thus causing the alarm to sound and continue sounding for as long as said flow continues. The break wheel 34 is preferably constructed so as to send a different signal from that caused by wheel 16. Either the stoppage of the escape flow at duct K, or an obstruction in the system on the inlet side of duct K, or any accidental arrest of the water wheel, will thus result in a signal being given by the alarm; and any increase of flow sufficient to generate current enough to swing armature 11 into the field of magnet 12 will produce a continuous and different signal.

I claim:

1. In combination with a conduit for liquid flow, a signal translating means, two signal transmitting devices, and means controlled by said flow for actuating said devices: one of said devices operating to actuate said translating means when said flow falls below, and the other of said devices operating to actuate said translating means when said flow rises above a predetermined rate.

2. In combination with a conduit for liquid flow, a signal translating means, a signal transmitting device, and means controlled by a stoppage of said flow for operating said transmitting device.

3. In combination with a conduit for liquid flow, a by-pass thereon, a water wheel interposed in and actuated by the flow in said by-pass, an escape duct on said by-pass on the delivery side of said wheel, an electric generator driven by said wheel, and an electrical alarm device controlled by said generator.

4. In combination with a conduit for liquid flow, a by-pass thereon, a water wheel interposed in and actuated by the flow in said by-pass, a signal transmitting device controlled by said wheel and operating upon a reduction of said flow below a predetermined rate, and a second transmitting device controlled by said wheel and operating upon an increase of said flow above said rate.

In testimony whereof I have affixed my signature in presence of two witnesses.

ALBERT GOLDSTEIN.

Witnesses:
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