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O. B. KAISER.

SIGNAL ALARM SYSTEM.

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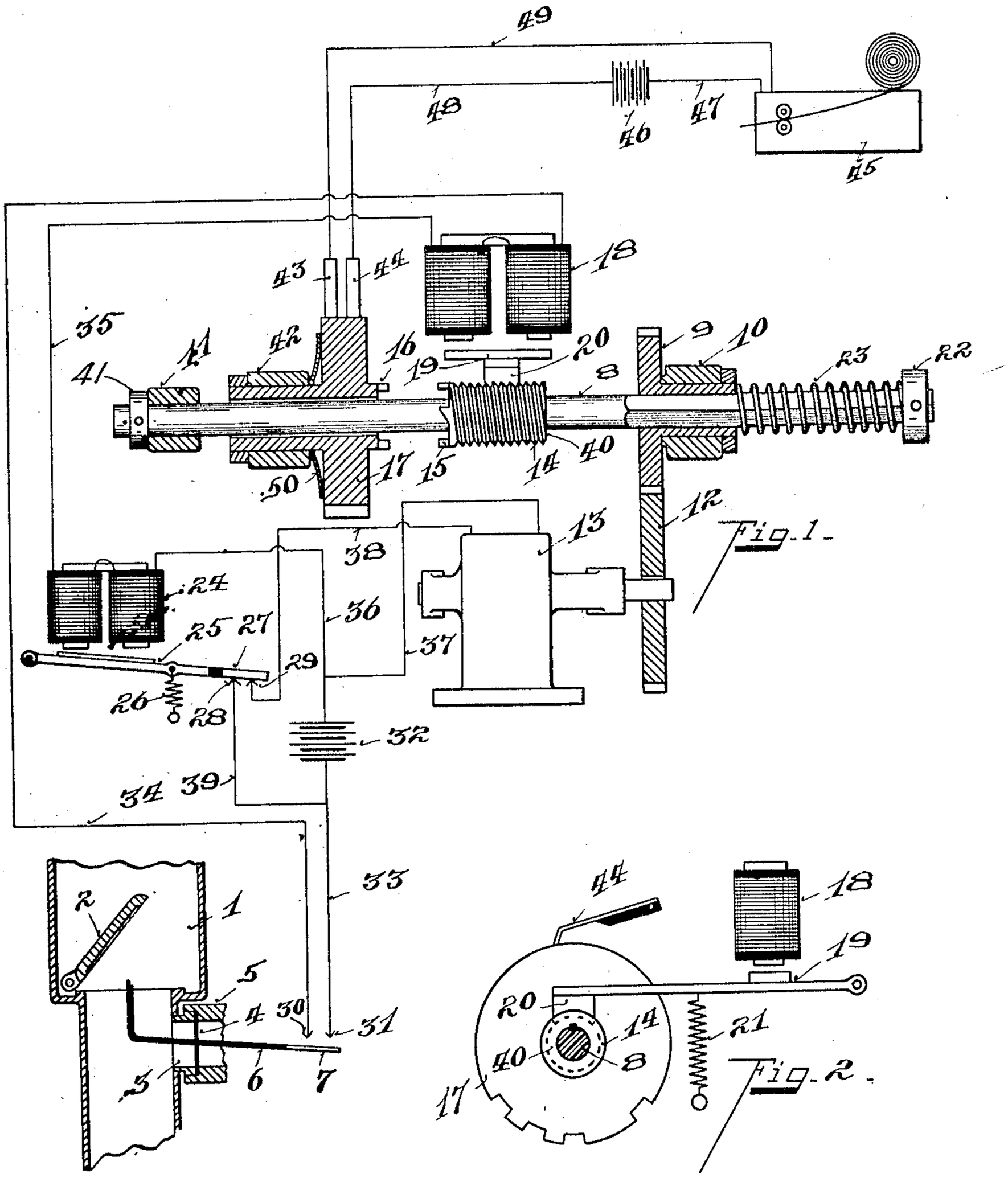

Fig. 1.

Fig. 2.

Witnesses

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SIGNAL-ALARM SYSTEM.

No. 876,192. Specification of Letters Patent. Patented Jan. 7, 1908.

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To all whom it may concern:

Be it known that I, OLIVER B. KAISER, a citizen of the United States, residing at Norwood, in the county of Hamilton and State of Ohio, have invented certain new and useful Improvements in Signal-Alarm Systems, of which the following is a specification.

My invention relates to an improvement in alarm signal apparatus.

The principal object of my improvement is to provide means whereby the apparatus is set in motion some time prior to the operation of the signal transmitting means.

Another object of my invention is to provide means whereby the apparatus is operated automatically to transmit a signal from a transmitter point to a central office, in which after the apparatus has been set in motion, it is positively operated by power and continues in such positive operation for a limit of time before the transmitting wheel is positively brought into operation.

The features of the invention are more fully set forth in the description of the accompanying drawings, forming a part of this specification, in which:—

Figure 1 is a diagrammatic view of the alarm system, illustrating the transmitting point and the receiving point. Fig. 2 is a side elevation of the signal indicating mechanism, and its electrically controlled operating mechanism.

The function of this invention relates principally to operating a signal system to be used in conjunction with a sprinkler system installed in a building, in which the apparatus is operated automatically by the opening of a sprinkler head, such sprinkler head being opened by fire or otherwise, and in which instance it is desirable to notify a central office that such sprinkler head or heads have opened, in which instance said central office can notify the fire department or salvage corps of the same, to prevent further damage to the contents in or to a building.

The apparatus is in electrical circuit with circuit controlling devices applied to the main or distributing pipe of the sprinkler system, and the apparatus in this pipe system is of such construction as to effect a breaking of the electric circuit by a flow of water through the mains. It frequently occurs in such systems owing to the varying pressures in the water mains that a water hammer effect is produced in the sprinkler mains, which would cause the circuit to be broken and the signal mechanism to be operated, but which water hammer effect is but momentary and therefore the signal apparatus must be provided with retarding means, whereby the signal is not transmitted to the central office for a period of time, say, twenty seconds, that is, water must be flowing through the sprinkler system twenty seconds before a signal is transmitted to the central office. The instrumentalities employed for accomplishing this result, are as follows:—1 represents the water main of the sprinkler system at a point to which make and break mechanism is connected controlling the circuit of the signal apparatus. One end of said main is extended to the distributing mains of a city water plant or the like, the opposite end is extended to the sprinkler system.

2 represents a valve hinged within the pipe 1 and adapted when the sprinkler system is in normal position to close the passage in said pipe 1.

3 represents a sleeve leading into the pipe 1 below the valve 2.

4 represents a diaphragm fixed to the sleeve 3 by the sleeve 5. 6 represents a rod passing through said diaphragm 4 and fixed thereto, one end projecting upward and adapted to contact with the valve 2 when the same is in normal position. 7 represents a switch member fixed to said rod 6 for closing the circuit to the signal mechanism, hereinafter to be described. This rod 6 through the particular construction of mounting has a vertical pivotal action, and as the valve 2 is down in its normal position, it will depress the rod 6 within the pipe 1 and raise the outside end thereof, and as the valve 2 rises the rod 6 will pivotally move to the position shown in the drawing.

8 represents a shaft, one end of which is squared and which squared end passes through a gear 9 journaled in the bearing 10. Said shaft 8 is adapted to slidably move through said gear 9 while the gear 9 is rotated, likewise imparting motion to the shaft 8.

11 represents a bearing for supporting the opposite end of shaft 8.

12 represents a gear wheel fixed to the

shaft of the motor 13, in this instance being an electric motor, but it is obvious that a spring motor or other suitable power means can be employed adapted to transmit motion to the shaft 8.

14 represents a worm fixed to and rotated by said shaft 8, one end of said worm being provided with a clutch member 15, adapted to be engaged with the clutch member 16 of the break wheel 17.

18 represents magnet coils, and 19 represents an armature lever, the free end of which is provided with a worm segmental nut 20, adapted when the magnet coils 18 are de-energized to mesh with the worm 14.

21 represents a spring for applying tension to the armature lever 19.

Thus it will be seen that when the shaft 8 is being rotated and the nut 20 is in engagement with the worm 14, it will cause the shaft 8 to be fed laterally while the said shaft is in motion toward the break wheel 17. If the magnet coils 18 should become energized they will attract lever 19 disengaging the nut 20 from the worm 14.

22 represents a collar fixed to the shaft 8, and 23 represents a coil spring encircling the shaft 8, adapted to move the shaft 8 into its normal position when the nut is disengaged from the worm 14. 24 represents magnet coils. 25 represents an armature lever adapted to be attracted by said magnet coils 24, and 26 represents a coil spring for applying tension to the armature lever 25. 27 represents a switch contact fixed to and moving with said armature 25 and insulated therefrom, adapted to contact with the switch contacts 28, 29.

30, 31, represents switch contacts adapted to be closed by the switch member 7 to energize magnet coils 18 and 24.

32 represents a battery or source of electric supply.

33 represents a wire leading from the source of supply 32 to the switch contact 31.

34 represents a wire leading from the switch contact 30 to the magnet coil 18.

35 represents a wire leading from the magnet coils 18 to the magnet coils 24.

36 represents a wire leading from the magnet coils 24 to the opposite pole of the source of electricity supply 32.

37 represents a wire leading from the source of electric supply 32, through wire 36 to one pole of the motor 13.

38 represents a wire leading from the opposite pole of the motor to the switch contact 29.

39 represents a wire leading from the switch contact 28 to the source of electric supply 32, through wire 33.

Thus when the apparatus is in normal position, switch member 7 will be in contact with the switch contacts 30, 31, closing the circuit to the magnet coils 18 and 24, through the following circuits:—From the source of electric supply 32, through wire 33, switch contact 31, switch member 7, switch contact 30, thence through wire 34 to one pole of the magnet coils 18, through said magnet coils, thence through wire 35 to the magnet coils 24, thence through the magnet coils and wire 36 to the opposite pole of the source of electric supply 32. As soon as the switch member 7 is disengaged from the switch contacts 30, 31, by reason of the valve 2 moving upward, the magnet coils 18 and 24 will become deënergized, releasing their armature levers 19 and 25 respectively, permitting the nut 20 upon armature lever 19 to become engaged with the worm 14 and bringing the switch member 27 of armature lever 25 into contact with the switch contacts 28, 29, closing the circuit to the electric motor 13 for revolving shaft 8, the circuit being as follows:—

From the source of electric supply 32, through wire 33 and 39, through switch member 27, thence through wire 38 to one pole of the motor, through the wire 37 and wire 36 to the opposite pole of the source of electric supply, which potential will cause the shaft 8 to be rotated and move longitudinally through the engagement of nut 20 with worm 14. When the shaft 8 has been moved to permit the clutch member 15 to engage with the clutch member 16 of the break wheel 17, the nut 20 will then have traversed to a position whereby it will become disengaged or ride off of the worm 14, descend further and bear against the shoulder 40 holding the clutch members 15, 16, into engagement with each other and stop the longitudinal feed of shaft 8. But as soon as the magnet coils become energized attracting their respective armature levers the nut 20 will become disengaged from the shoulder 40, thereby permitting shaft 8 to be moved automatically into its normal position through the tension of spring 23. This same automatic movement to normal position of the shaft 8 taking place irrespective of any distance of the longitudinal feed imparted thereto as soon as the same is released by the nut 20, caused through the energizing of magnet coils 18. Thus it will be seen that if the valve 2 shall be caused to swing upward breaking the circuit to the magnet coils 18 and 24, that the shaft 8 will immediately begin to rotate and be fed forward, but that a signal will not be transmitted until the valve 2 has remained in its upward position for a given period of time to permit the clutch members 15 and 16 to become engaged. The longitudinal feed of shaft 8 can be timed by adjusting the collar 41 on shaft 8, moving the shaft to the right or left which will adjust the clutch members 15 and 16 to or from each other as desired.

The signal is transmitted to the central office as follows:—The break wheel 17 is provided with a sleeve journaling in the single

bearings 42. 43, 44, represent brush contacts engaging the periphery of the break wheel 17 and being of the usual construction. 45 represents an indicating or recording device of usual construction in circuit with the brush contacts 43, 44. 46 represents a battery or source of electric supply. 47 represents a wire leading from one pole of the source of electric supply to the indicating and recording device 45. 48 represents a wire leading from brush contact 44 to the opposite pole of the source of electric supply. 49 represents a wire leading from brush contact 43 to the indicating and recording device 45. The circuits of the indicating and recording device being controlled by the break wheel 17 to transmit a signal in the usual manner.

In order to prevent a possible danger of the clutch members from improperly engaging with each other, the following instrumentalities are provided:—50 represents a spring through which the sleeve of the break wheel passes for normally holding the break wheel in the position shown in the drawings, but if the teeth of the clutch members should improperly engage with each other the longitudinal feed of the shaft 8 will cause the break wheel to be moved slightly in the same direction, when the rotation of the shaft 8 will move the teeth of the clutch members from such improper engagement the break wheel 17 being moved immediately thereafter to its normal position by the spring 50.

Having described my invention, I claim:—

In a signal system, a signal transmission member, means for driving said member, means for causing the driving mechanism to operate under abnormal conditions of the system, means for causing predetermined idle operations prior to a signal transmission, and means for restoring the mechanism to normal position immediately upon restoration of the system to normal condition, substantially as described.

2. In a signal system, in combination with a fire extinguisher system, power actuating devices, means whereby said power actuating devices are set into activity by a liquid flow of said extinguisher system, a signal transmitting device means in positive driven connection with said power device adapted to move idly for a predetermined time, and positively actuate said signal transmitting device after said predetermined idle movement has elapsed, and means for restoring the actuated parts to their normal position after the activity of the liquid flow has ceased, substantially as described.

3. In a signal system, signal transmission devices to indicate the abnormal condition of the system, means for permitting the system to remain in an abnormal condition for a predetermined time prior to a signal transmission and means to instantly restore the mechanism to normal position upon restoration of the system to normal condition, substantially as described.

4. In a signal system, an actuating device, means for operating said actuating device, a signal actuating mechanism in positive driven connection with said actuating device adapted to be simultaneously operated therewith and moved idly for a predetermined time, means for transmitting a signal after said predetermined idle movement of the signal actuating mechanism has elapsed, and means for restoring the parts to their normal position whenever said actuating device is at rest, substantially as described.

5. In a signal system, signal transmitter mechanism, means for driving said transmitter mechanism, automatically set into motion upon abnormal condition of the system for signal transmission operation, means for causing idle drive for a predetermined time prior to a signal transmission, and means for automatically restoring the parts to normal condition for a second operation prior to or after a signal transmission upon the restoration of the system to normal condition, substantially as described.

6. In a signal system, signal transmitter mechanism, means for actuating said transmitter mechanism, means whereby said transmitter actuating mechanism is caused to operate idly for a predetermined period of time prior to a signal transmission operation, and means for instantly restoring the parts to their normal position whenever said actuating mechanism is at rest, substantially as described.

7. In a signal system, signal transmitter mechanism, means for driving said transmitter mechanism automatically set into operation upon abnormal condition of the system, means for permitting the system to remain in abnormal condition for a predetermined time prior to a signal transmission, and means to instantly restore the mechanism to normal position upon restoration of the system to normal condition, substantially as described.

8. In a device of the class described, a driving shaft, means for driving said shaft, an armature lever, a magnet for controlling said armature lever, a driven member, and means associated between said driving shaft and armature to actuate the driven member after a period of idle movement when the armature lever occupies one position, substantially as described.

9. In a device of the class described, a driving shaft, means for driving said shaft, an armature lever and controlling magnet, a driven member, means associated between said armature lever and driving shaft to actuate the driven member after a period of idle movement when the armature lever occupies one position, and means for automatically restoring the parts to normal position after

the armature lever is moved to a second position, substantially as described.

10. In a device of the class described, a driving member, means for driving said member, a driven member, intermediate transmission mechanism between said driving and driven members, actuated for a predetermined time prior to imparting movement to said driven member, and means for automatically restoring the parts to normal position prior to and after said driven member is actuated, substantially as described.

11. In a signal system, a system under supervision, a driving member, means for driving said member actuated automatically at abnormal conditions of the system under supervision, a driven signal transmission member actuated by said driving member, means for actuating said driving member idly for a predetermined time prior to a signal transmission, and means for restoring the mechanism to normal position upon normal condition of the system under supervision, substantially as described.

12. In a device of the class described, a driving member, means for driving said member, a signal transmission member, an armature lever under control by a system under supervision, a screw feed for controlling the transmission of a signal, said armature lever provided with means for engaging said screw feed at abnormal conditions of the system under supervision for causing a predetermined idle movement prior to a signal transmission, substantially as described.

In testimony whereof, I have hereunto set my hand.

OLIVER B. KAISER

Witnesses:
LUISE BECK,
LEO O'DONNELL.