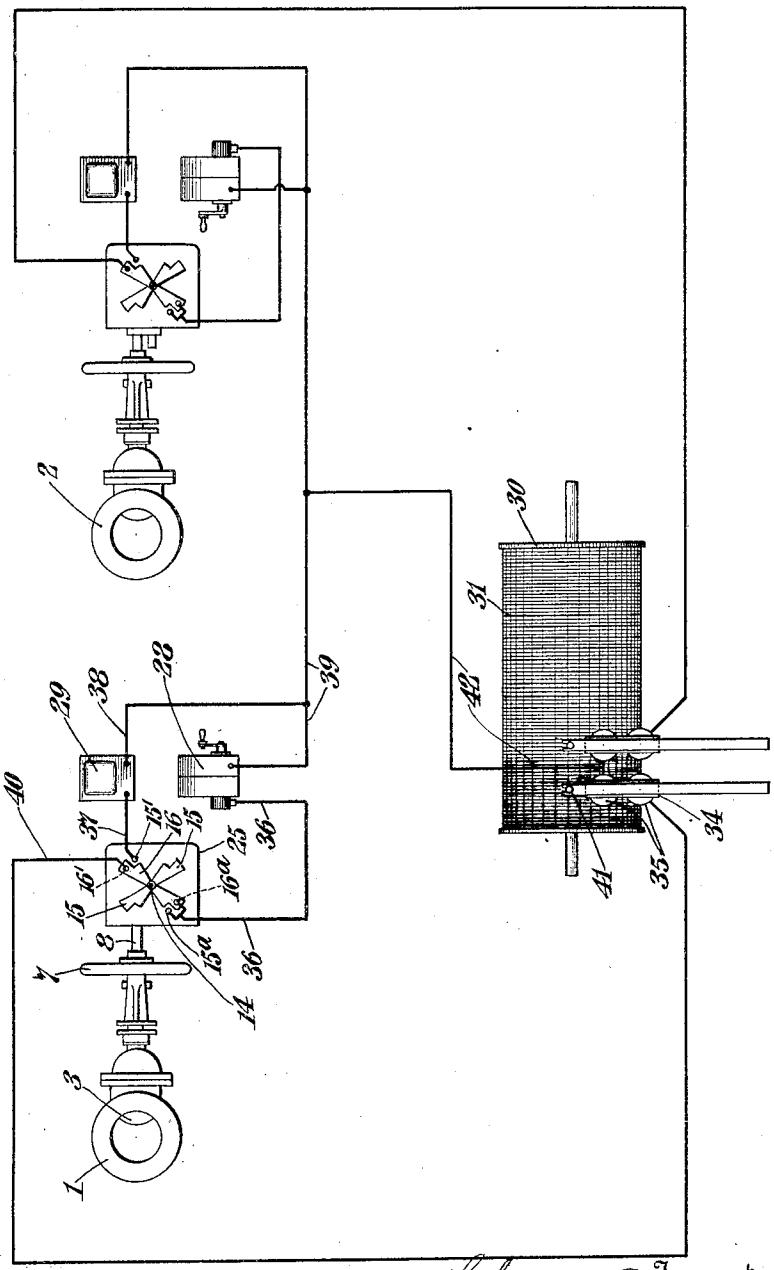
May 22, 1923. 1,456,149

C. E. RENSHAW

RECORDING APPARATUS FOR VALVES AND THE LIKE

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Fig. 1.



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RECORDING APPARATUS FOR VALVES AND THE LIKE

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Fig. 2.

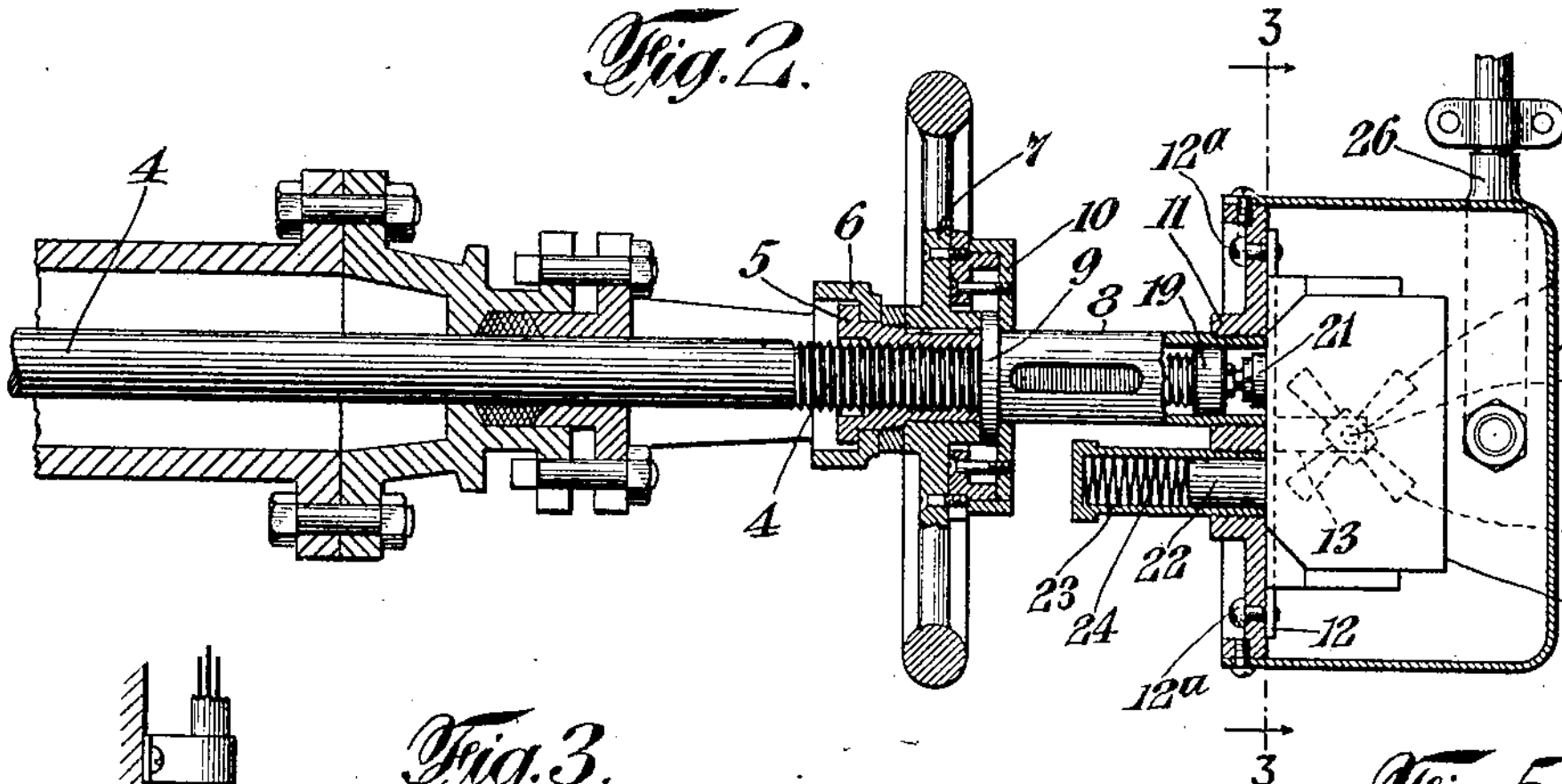


Fig. 3.

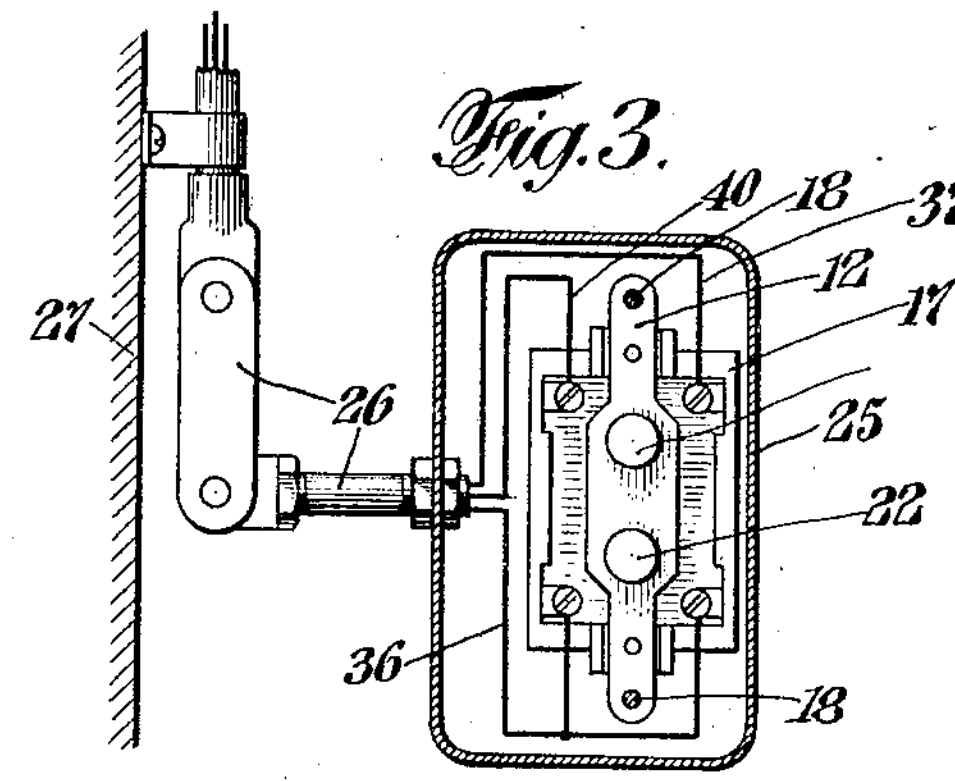


Fig. 5.

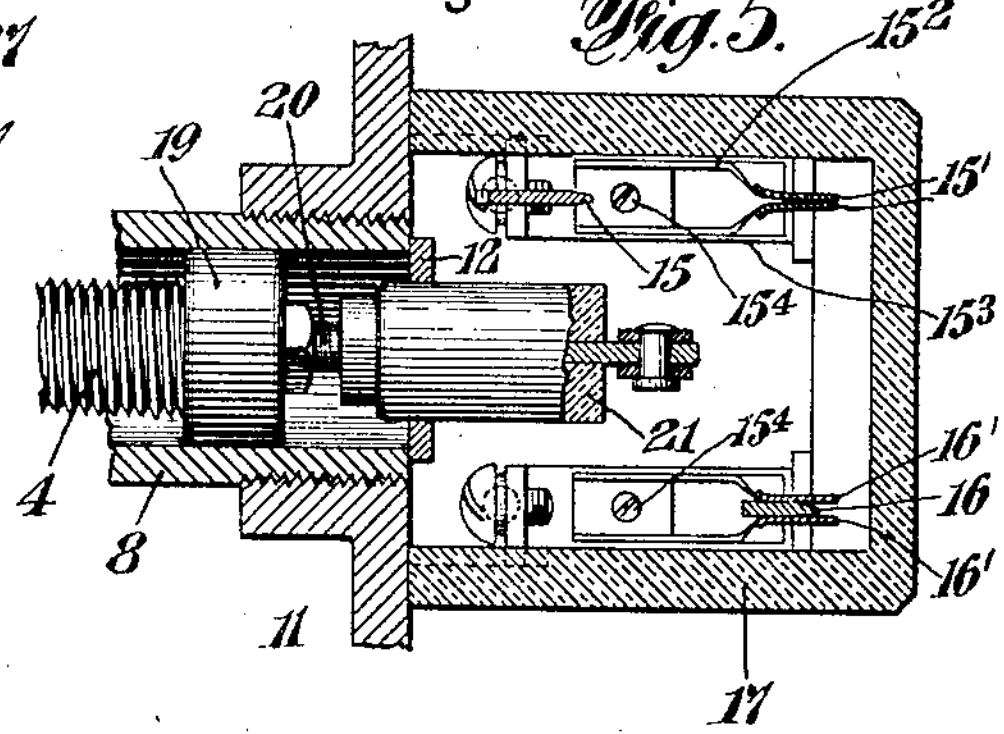
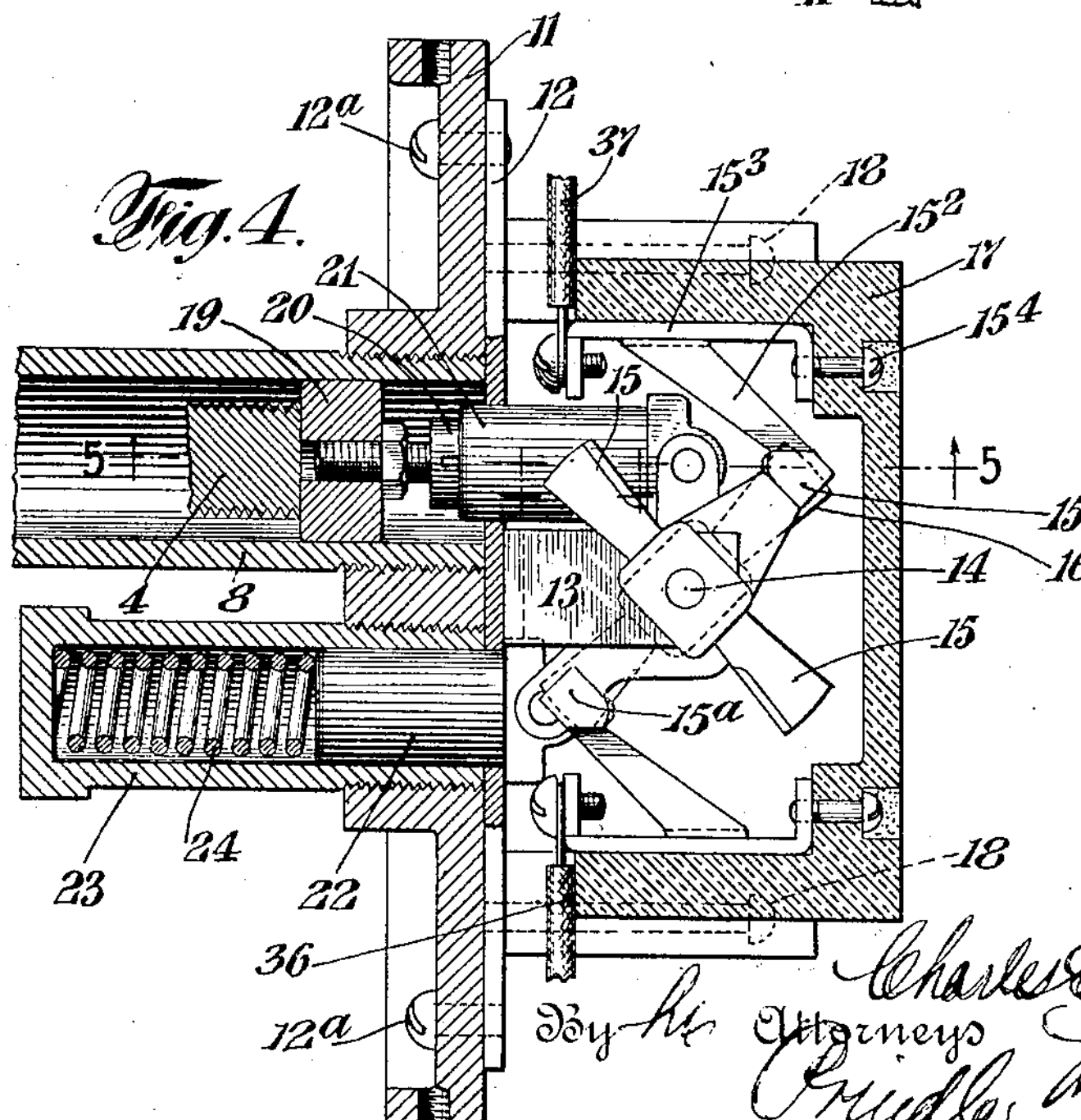


Fig. 4.



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RECORDING APPARATUS FOR VALVES AND THE LIKE

Filed July 29, 1919 3 Sheets-Sheet 3

Fig. 6.

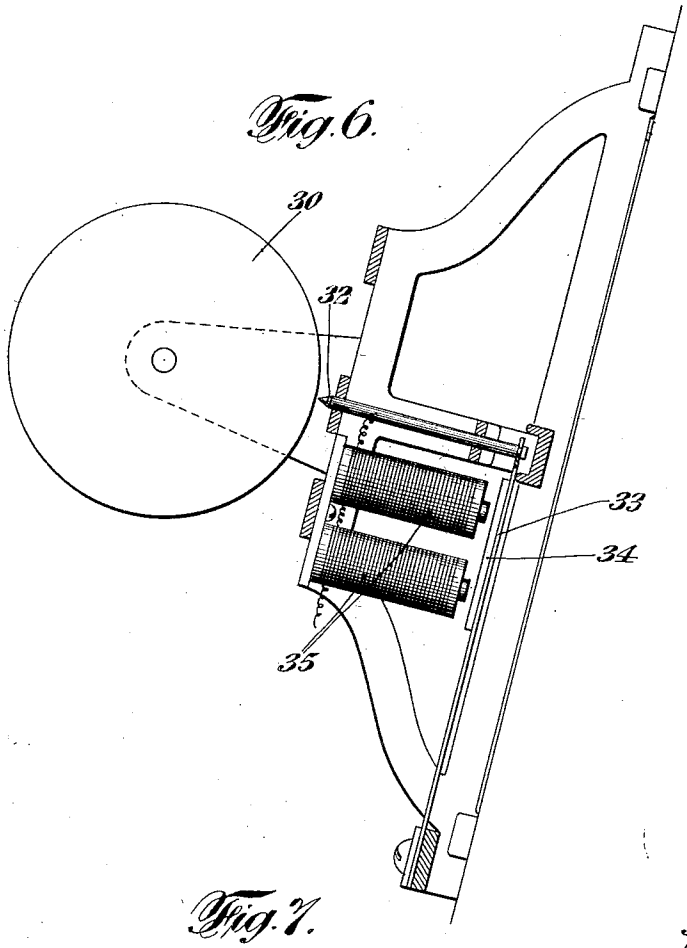
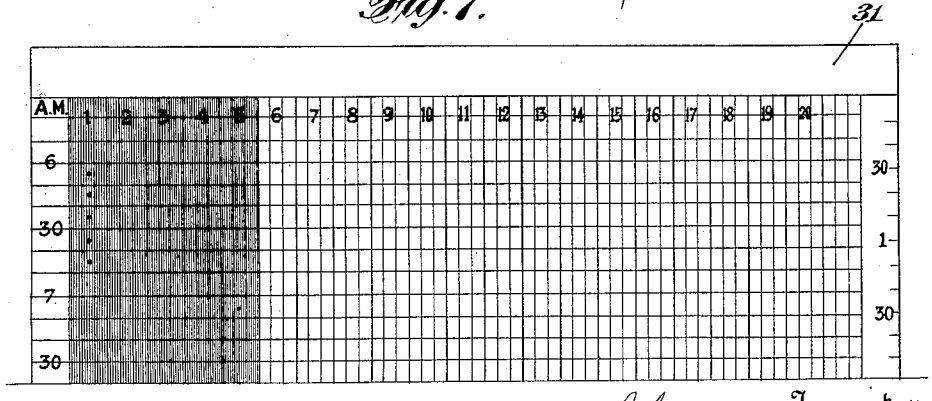


Fig. 7.



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Patented May 22, 1923. 1,456,149

UNITED STATES PATENT OFFICE.

CHARLES E. RENSHAW, OF EAST ORANGE, NEW JERSEY.

RECORDING APPARATUS FOR VALVES AND THE LIKE.

Application filed July 29, 1919. Serial No. 313,966.

To all whom it may concern:

Be it known that I, CHARLES E. RENSHAW, a citizen of the United States, residing at East Orange, in the county of Essex and State of New Jersey, have invented a certain new and useful Improvement in Recording Apparatus for Valves and the like, of which the following is a specification.

The object of my invention has been to provide a recording apparatus for valves and the like, which shall be capable of making a record or a signal, or both, when the valve or other device is in a predetermined position or condition; of indicating the time when said record was made; which shall be comparatively simple in construction and convenient in operation, and which shall be adapted to be operated in conjunction with the ordinary apparatus for recording the visits of a watchman to stations about a plant; and to such ends my invention consists in the recording apparatus for valves and the like hereinafter specified.

In the accompanying drawings,

Figure 1 is a diagrammatic view of two valves of a sprinkler system and a recording apparatus therefor embodying my invention;

Figure 2 is a longitudinal sectional view showing a valve system, the parts by which it is operated, and electric switch mechanism connected therewith;

Figure 3 is a section on the line 3—3 of Figure 2;

Figure 4 is an enlarged view of the electric switch and parts for housing and operating the same, which are shown in Figure 2;

Figure 5 is a section on the line 5—5 of Figure 4;

Figure 6 is an end elevation partly in section of the essential parts of the recording mechanism;

Figure 7 is a view of a portion of a record blank adapted for use in said recording mechanism.

In the drawings I have illustrated the best embodiment of my invention known to me, but my invention is capable of embodiment in many different forms and is, therefore, not to be limited to the form shown, but such form is only to be regarded as typical.

In the drawings, my invention is applied to the valves controlling the pipe lines leading to groups of sprinklers which are used for the prevention of fire, such sprinklers being automatically operated upon a sufficient rise in temperature to indicate the presence of fire. When it is necessary to repair the sprinklers or to extend the pipe lines, etc., the valves referred to are closed, and it not infrequently happens that the workmen forget to open them after the purpose has been accomplished for which they were closed. Dangerous fires and loss of life may result from such failure.

My recording apparatus as illustrated is intended to make a record of the fact at a central point,—say the office of the plant,—when any particular valve is open, and negatively to indicate the fact that it is closed by not making a record; and also to call the watchman's attention by a signal to the fact that the valve is closed.

The illustrated example of my invention is intended particularly for use where the watchman is required to periodically visit stations about the plant and to record the fact of the visit to each station by means operable only at each station, and making a record in the office of the plant.

Broadly speaking, my invention consists in a recording apparatus, which is preferably electrically operated, and means at each valve to be operated by the watchman each time he visits the station at the valve, which means generate or controls power that will make a record at the office if the valve is open, and will negatively indicate that the valve is closed by not making a record when the valve is in that condition, the means preferably being operable by the watchman whether or not a record is made.

My invention also preferably includes a signal, audible or visible, which, when the watchman operates the means for generating or controlling power, will also be operated, and call his attention, if the valve is closed.

In the embodiment in the drawings, I have shown two valves 1 and 2 of a sprinkler system, but the invention can be applied to any number of valves. The valves are shown as having a gate 3, which is moved by a stem 4 by means of the rotation of a sleeve 5 that is journaled in a bracket 6 mounted on the housing of the valve, the sleeve being rotated by a hand-wheel 7 secured thereto. An electric switch mechanism is shown as supported on a tube 8 that

surrounds the stem and that has a flange 9 resting against the hub of the hand-wheel and held thereagainst by a cap 10 that is secured to the hand-wheel. The tube 8 supports a base 11, to which is secured a switch, which in the present instance is a double-pole "snap switch." A plate 12 is secured to the base 11, as by screws 12^a, and a bearing block 13 is mounted on the said plate and affords bearing for the shaft 14 of the switch. The shaft carries double knife blades 15 and 16, which are insulated from each other. The switch is enclosed in a porcelain box 17, which is secured to the plate 12 by screws 18. At one end of the box (the upper end as seen in Figure 4) are mounted two pairs of contacts, which are duplicates of each other, and insulated from each other, and one pair of which 15′ is adapted to cooperate with the adjacent end of blade 15, and the other pair of which 16′ is adapted to cooperate with the adjacent end of blade 16. Being duplicates, it will only be necessary to describe the details of construction of one of these pairs of contacts.

The contacts 15′ are formed on the ends of spring arms 15^2, which rise from a base 15^3, the latter being secured to the box as by a screw 15^4. The blade preferably has a sharpened or knife edge, and the contacts are preferably flared apart, as shown in Figure 5, so that the blade can be made to force the contacts apart and thus make good electrical connection. At the opposite end of the box 17 (the lower end as seen in Figure 4) are two pairs of contacts 15^a and 16^a, which, being precisely like the contacts at the upper end of the box, will not be described in detail. One or other of the blades 15 or 16 is thrown into engagement with its two pairs of contacts by oscillating the switch shaft in one or the opposite direction. Such a switch, as is well known, is so constructed that when it is pushed a given distance in one direction it will then spring the rest of the distance to make a quick contact and break and avoid arcing, and vice versa. As the details of the mechanism for causing this snapping of the switch are well known, they are not illustrated in the present case.

The initial push of the shaft in one direction is caused by the valve stem, and that in the other direction by a spring. As shown in Figure 4, a block 19 rests against the end of the valve stem and is guided in the tube 8. A screw 20 is threaded in the block and rests against a plunger 21, that is guided in the plate 12 and connected with the switch-throwing mechanism. The screw 20 is adjustable in the block 19, so that it will properly co-operate with the switch-throwing mechanism. The switch is thrown in the opposite direction by a plunger 22, which is mounted in a housing 23 secured to the base plate 11, a spring 24 being mounted in said housing and tending to throw the plunger 22 toward the switch mechanism. Thus, when the valve stem moves to the right as seen in Figure 4, due to the opening of the gate of the valve to its normal position, the block 19 and with it the screw 20 are moved to the right, forcing the plunger 21 in the same direction and pushing the valve snapping mechanism to the point where it will snap the blades to the right. In Figure 4, the valve stem is shown in its farthest position to the right, with the gate entirely open, and, consequently, with the blades 15 in engagement with the contacts 16′ and 16^a. If the valve should be closed, the spring will force the plunger 22 to the right and push the valve snapping mechanism in the opposite direction until the latter will snap the blade 15 in engagement with its two pairs of contacts 15′ and 15^a.

A cover 25 is secured to the base plate 11, and the parts are prevented from rotation by a conduit 26 that is secured to the wall 27.

As shown in Figure 1, a source of power, which in the present instance is a magneto electric generator 28, is located near each valve, and also a signal 29, which in the present instance is shown as a buzzer.

The recording mechanism consists of a drum 30, driven by clockwork (not shown), upon which is mounted a record sheet 31 that is ruled in vertical numbered columns to indicate valve stations or the ordinary watchman's stations. In the present instance, the columns 1 to 5 are shaded and are intended for valve stations, and the remaining columns for watchman's stations. The record sheet is ruled horizontally to indicate time. Records both for valve stations and the watchman's stations are made by punches 32 secured to the upper end of springs 33, carrying armatures 34, which, upon being attracted by magnets 35, when energized by current from the magneto, as later to be described, force the punch forward and cause it to make an indentation in the record sheet.

The connections between the various parts are as follows: From one pole of the magneto, a wire 36 is branched to the base of the contacts 15^a and 16^a. From the base of the contacts 15′, a wire 37 runs to one pole of the buzzer, a return wire 38 leading from the buzzer to a wire 39 that runs back to the magneto. From the base of the contacts 16′, a wire 40 runs to the magnet 35, adapted to operate punch 41 of valve No. 1, a wire 42 running from the magnets back to the return wire 39 leading to the magneto.

In the operation of my mechanism, the

watchman at stated intervals visits the valve station,—that of valve No. 1, for instance,—and operates the magneto, as by turning its crank. If the valve is open, the current generated passes by the wire 36 to the contacts 16ª and through the blade 16 to the contact 16′, and thence by wire 40 to the first magnet 35 of the recorder, operating the punch 41 and making a punch mark in column No. 1, the current returning to the magneto by wire 42. Thus, if the valve No. 1 is open, a record is made at the time of the visit of the watchman, but the buzzer is not operated. If, on the other hand, the valve should be closed, to an objectionable extent, when the watchman operates the magneto, the current would pass from the magneto by the wire 36 to the contacts 15ª, and thence by the blade 15 to the contacts 15′ and by the wire 37 through the buzzer, operating the latter and calling the watchman's attention to the fact that the valve is not in normal position, so that he could open the valve. If the watchman should not open the valve, no punch mark would be made on the record sheet, and the attention of an inspector of the sheet would be called to the fact that the valve is not open, because of the absence of the usual punch marks in the proper column for the valve.

My invention enables a watchman to make a positive or a negative record of the position of valves on a recording mechanism in the office of a plant by visiting the valve stations and performing an operation very much the same as the operation which he ordinarily performs, either to make a record on a recording apparatus at the central station such as I have illustrated or by use of the ordinary watchman's clocks. Thus, my apparatus, without substantially changing the habits or system of watchmen already accustomed to the visiting of the ordinary stations, provides a safeguard against a valve or other device remaining in an undesired position, by a simple addition to the system already in use for the visits by the watchman to the usual stations about a plant.

An advantage of using magnetos is that they are an exceptionally reliable source of current, being particularly infallible when motion is imparted to the armature. Thus it will be seen that I have provided a relatively simple apparatus which will prevent possible fires and loss of life due to the inadvertent failure to open the valves of a sprinkler system and one which can be installed with comparatively low cost in a plant which already has a watchman's recording system, and without disturbing such system.

I claim:

1. In a recording apparatus for valves and the like, the combination of a valve, a manually operable device, a recording means and a signal, and connections such that a record can be made by manual operation of such device when the valve is in a desired position, but preventing the operation of the signal, and such that the signal will be operated by manual operation of such device when the valve is in an undesirable position, but the making of a record will be prevented.

2. In an automatic sprinkler system for fire prevention the combination of a valve for controlling the supply of the sprinkling fluid, a manually operable device, a recording means and a signal, and connections such that a record can be made by manual operation of such device when the valve is in a desired position, but preventing the operation of the signal, and such that the signal will be operated by manual operation of such device when the valve is in an undesirable position, but the making of a record will be prevented.

3. In an automatic sprinkler sytem for fire prevention, the combination of a valve adapted to be positively operated through different positions to control the supply of the sprinkling fluid, recording means, a source of power at said valve, and connections controlled by said valve in one of said different positions for enabling said recording means to be operated from said source of power but preventing said recording means from being operated from said source of power in other positions of the valve.

4. In a recording apparatus for valves and the like, the combination of a plurality of valves, a signal, a single recording means adapted to make a separate record for each valve, a separate source of power at each valve, and connections controlled by said valves for operating said recording means.

5. In a recording apparatus for valves and the like, the combination of a plurality of valves, a single recording means adapted to make a record for each valve, a magneto at each valve, and connections controlled by each valve for enabling said recording means to be operated by the corresponding magneto.

6. In an automatic sprinkler system for fire prevention, the combination of a valve adapted to be positively operated through different positions to control the supply of the sprinkling fluid, recording means, a manually operable magneto at said valve, and connections between said magneto and said recording means controlled by said valve.

7. In a recording apparatus for valves and the like, the combination of a valve and recording means, a signal, a mechanical electric generator at said valve, and connections such that, in a given position of the valve, recording means will be operated and the

signal remain inoperative; and in another position of the valve the signal will be operated and the recording means remain inoperative.

8. In a recording apparatus for valves and the like, the combination of a plurality of valves, a signal, recording means for said valves, an electric generator for each of said valves, and connections such that, when said valve is in a particular position, the recording means will be operated and the signal remain inoperative; and when said valve is in another position, the signal will be operated and the recording means remain inoperative.

In testimony that I claim the foregoing, I have hereunto set my hand this 23rd day of July, 1919.

CHARLES E. RENSHAW.