Siemens Morse Recorder Fire Alarm System Technical Description

Technical Decription

This fire alarm is of the closed-circuit type, and consisted of 16 Alarm Pillars, one Main Switchboard and Batteries.

The Alarm Pillars are normally connected in series with the battery.

Plate 2 shows the general arrangement of the system, and in conjunction with the following explanatory matter, will, it is hoped, enable the whole system to be thoroughly understood.

Alarm Pillars (general)

Each of the Alarm Pillars are fitted with a clockwork apparatus, operated by means of a weight, which causes a Type-wheel to rotate. A contact spring rubs against the periphery of Type-wheel - the Type-wheel and contact spring being connected with the circuit. As the Type-wheel revolves the circuit is alternately broken and closed according as a tooth and space passes the spring. The Type-wheels of the Alarm Pillars are all cut with a different code, so that each pillar transmits a characteristic signal to the receiving station where it is printed on the Morse Slip.

Alarm Pillar Mechanism

The mechanism of each alarm pillar is as follows: -
(See Plate 1)

[1] - Wheel "A" is geared with wheel "B" through lantern pinions and spur wheels in the velocity ratio of 1 to 12.

The cam "C" which is fixed to wheel "A" controls the locking device "L", and limits the turning movement of the clockwork for each alarm.

Drum "D" is free to rotate in an anti-clockwise direction on spindle of wheel "A" to facilitate the winding up of the weight "W".

The speed of the clockwork, when working, is controlled by means of a fly, whose spindle is geared to wheel "B" through a lantern pinion.

As will be seen from cam "C" the complete turning movement of wheel "A" for each alarm call is one half revolution, and of wheel "B" six revolutions.

Fixed rigidly on spindle of wheel "B", but insulated from same, is a sprocket or code wheel "T", which makes and breaks the earth and line connections simultaneously a
definite number of times for each fire-call, the code is received and registered six times in succession on the tape of the Morse-inker or each alarm.

The two small insulated pins "K1" and K2" on the side of wheel "A" close and open the earth connection respectively before and after each fire call.

Method of operating Alarm Pillars

There are two ways of operating an Alarm Pillar, viz: -
(a) By simply pulling the handle "H"
(b) By means of the Extension Alarm Push.
Both these methods bring about the same result, inasmuch as they both release the locking device "L" of the clockwork.

The latter of these two devices is not in use at the RSA Factory, so that the working of the Alarm Pillar mechanism is as follows: -

Action of clockwork in Alarm Pillars

When an alarm is given by pulling handle "H", beam "E" through the medium of spring "S1", releases wheel "B" at "L", which revolves in an anti-clockwise direction under the influence of weight "W" acting through the gearing.

The clockwork continues to run until the wheel "A" has made half a revolution, when through the jockey roller "R" on beam "E" dropping into clearance of cam "C", the wheel "B" is locked at "L".

The earth connection at "M" is made and broken respectively at the commencement and finish of the call.

During the running of the clockwork the code-wheel "T" makes and breaks the line and earth connections a definite number of times, and these breaks in the circuit are recorded on the tape of the Morse-inker.

Fire Bell Step Relay

The Fire Bell Step Relay circuit is closed and broken through the beam of the Morse-inker, and by means of an escapement device is arranged to close the Fire Bell circuit after four successive breaks of the main circuit during an alarm.

There are three positions for the balance-weight of this relay, viz: - (1) Cut-out (2) Normal (3) Alarm.

When this weight is placed in position (1), the relay is inoperative.

When this weight is placed in position (2), it is ready to perform its allotted task, viz: to give the Fire Call Alarm after four successive beats of the beam of the Morse-inker.

Switching Bells

These bells are connected through the beam of the Morse Inkers with a local battery, in such a way as to ring when an alarm is given from any of the Alarm Pillars. They contain and actuate the switches marked B1, B2, B3, B4 and B5.

These switches normally are as shown by full lines on Plate 2, but on an alarm being given they take up the positions shown by broken lines.

Earth Detector, Earth Key, Earth Relay, and Breakdown Switch
The Earth Detector shows at a glance whether the circuit is in good condition, and the Earth Relay closes the circuit of the Earth Bell when the leakage on the line becomes bad. The Station Official will then open the Earth Switch, which should remain open while the fault exists.

If the line should break down, the Milliammeter will show this by falling to zero. The Breakdown Switch should then be operated, thereby actuating switches R1, R2, R3, and R4, which together put the system into working order, with the centre of the battery permanently to earth, while the break in the line exists.

The system may therefore be used under these conditions until the opportunity arrives for examining the line and removing the fault.

General

If an alarm is given at two Pillars at the same moment, the codes of the two pillars will be received simultaneously at the Switchboard, one on each recorder.

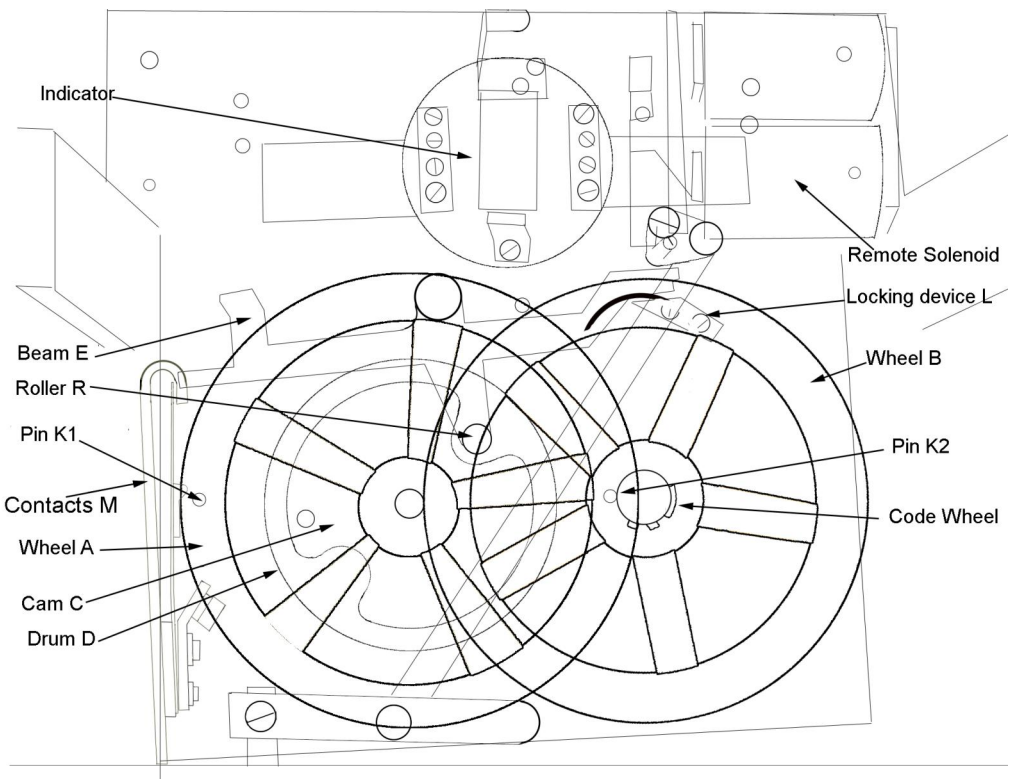
Example: - If Pillars 1 and 2 are in operation together, Pillar 1 will register its code on Morse-inker 1, and Pillar 2 on Morse-inker 2. Each Pillar will work off opposite halves of the battery, with the earth as common return.

Similarly, if the line should break, and the breakdown Switch has been actuated, a call from an alarm pillar on the left side of the break (see Plate 2) will register its code on the Morse Inker No. 1, and a call from an Alarm Pillar on the right side of the break on Morse Inker No. 2.

Example: - If Alarm Pillar 1 is operated, the current will pass from the battery, through the earth to the Alarm Pillar and return to the battery through the line and earth.

Plate 1

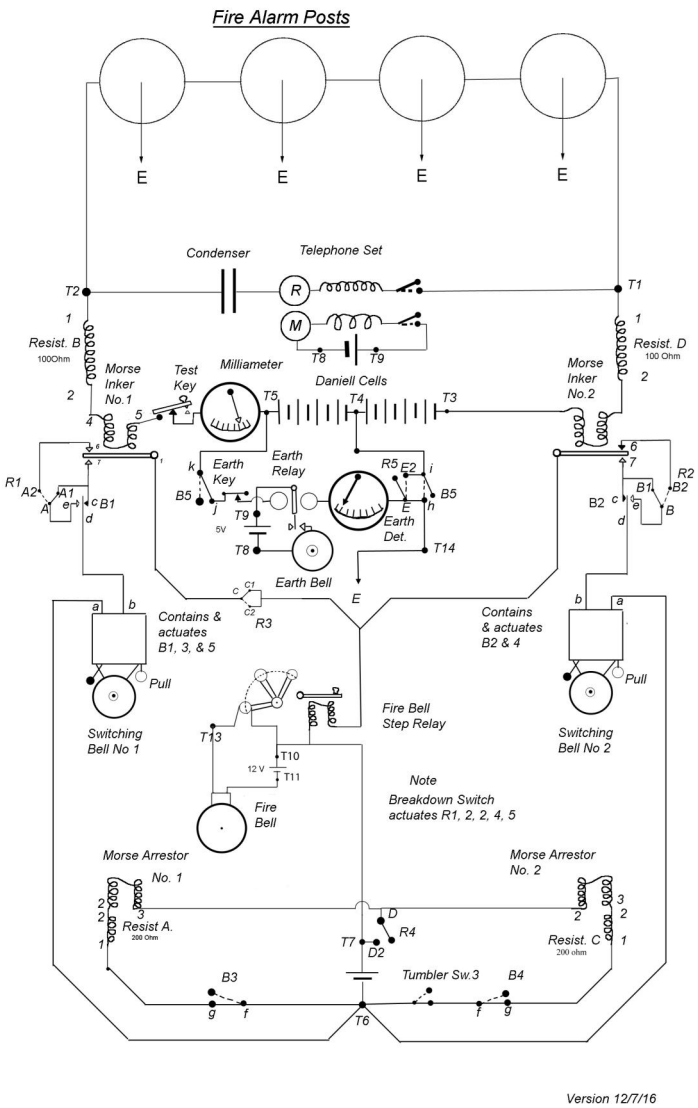
Drawing of Pillar Mechanism viewed from rear



Note: The Code Wheel is actually mounted on the front panel but shown here to give its location, driven by wheel B.

Plate 2

RGPF Panel Circuit Diagram



RGPF Fire alarm Pillar Locations

Details of Signals sent from each Fire Alarm Pillar

UPPER WORKS (North Site)

--	NG Hill
---	Daisy Island
.-	Edmondsey Stoves
..-	Edmondsey Engines
...-	Long Walk
....-	Group E
.....	Group A
-....	Refinery Gate

LOWER WORKS (South Site)

-...	Lower Island
-..	Swing Bridge
-.	Proof Range
.--	Gun Cotton Laboratory
.-.-	Nitric Acid Factory
.-..-	Cordite Office, Quinton Hill
.-.	Black Ditch (West)
..--	Acetone Recovery

Note: The precise locations are not known.