

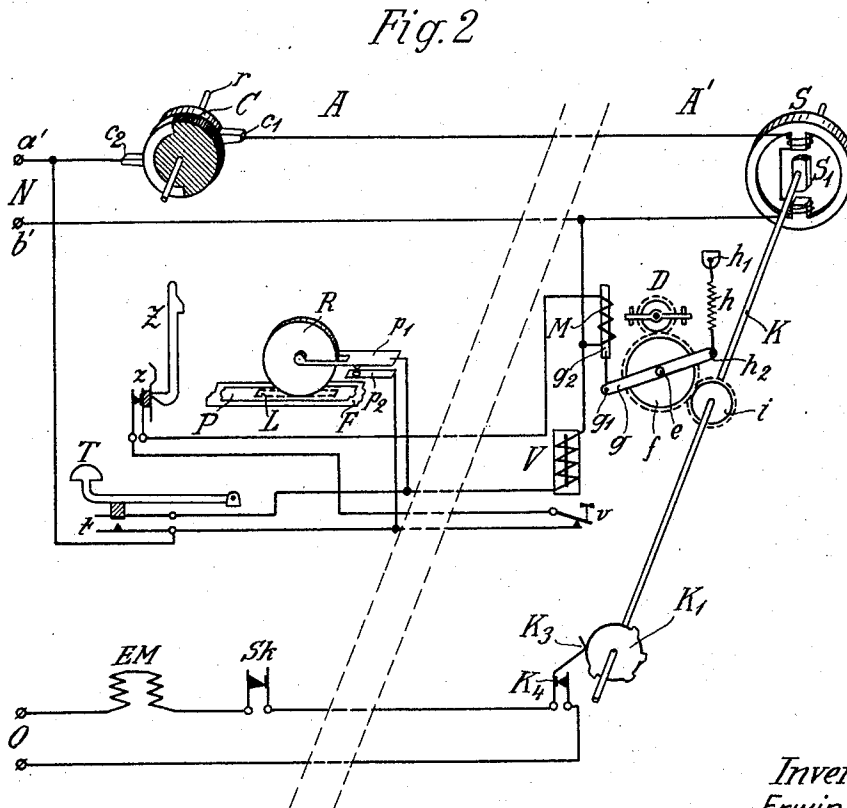
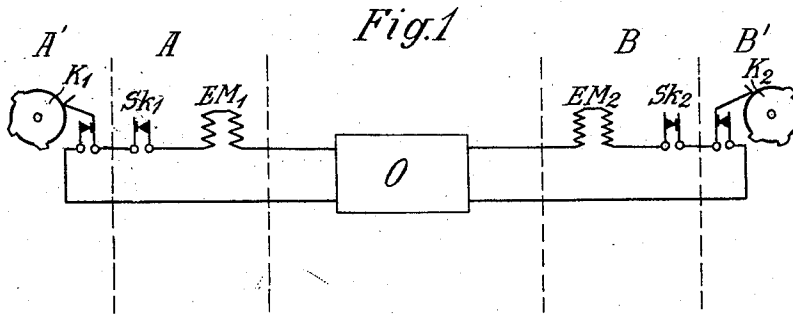
March 28, 1933.

E. LIESK ET AL

1,902,964

SUPERVISORY DEVICE FOR TELEGRAPH APPARATUS

Filed March 26, 1931



Inventors:
Erwin Liesk
and Wilhelm Kruse
by *R. C. Haggood*
Attorney

UNITED STATES PATENT OFFICE

ERWIN LIESK, OF BERLIN, AND WILHELM KRUSE, OF WILHELMSHAGEN NEAR BERLIN,
GERMANY, ASSIGNORS TO C. LORENZ A. G., OF BERLIN, GERMANY

SUPERVISORY DEVICE FOR TELEGRAPH APPARATUS

Application filed March 26, 1931, Serial No. 525,414, and in Germany March 29, 1930.

The present invention relates to a device for supervising telegraphic apparatus in order to indicate the continued maintenance of a previously established connection between a calling and a called station.

It is already well known in telegraphy and similarly related arts that special signalling means may be installed at a called telegraph station so that upon the establishment of a connection between telegraphic apparatus associated with a calling station and that associated with a called station, an answering signal is automatically sent back to the calling station in the form of letters or numbers. The single transmission of the answering signal upon the establishment of a connection with the called telegraph apparatus assures the calling station that the proper subscriber has been called and that the apparatus at that station is ready for operation, but there is no certainty that the apparatus will subsequently remain ready for reception throughout the entire period during which the connection may be desired. Often in the sending telegraphic messages very important news must be transmitted. In this case the calling subscriber should have suitable means of assuring himself that, at all times during the transmission period, the telegraph apparatus at the particular called station remains ready for reception.

According to the present invention this problem is solved by having the subscriber at the calling station transmit a signal which initiates the operation of apparatus at the called station adapted to automatically send back a similar or predetermined signal, thereby indicating the readiness of the called station to continue to receive signals transmitted by the calling subscriber's station. During the transmission of the answering signal the supervisory device associated with the calling subscriber's station for signalling back to the called subscriber's station is automatically rendered inoperative.

A further feature of the invention is that upon the breaking or termination of the paper tape at the receiving station the transmission of the answering signal cannot take place.

An arrangement of the device embodying the invention is illustrated by way of example in the drawing in which:

Fig. 1 diagrammatically represents two telegraph stations having connections established through central office O; and

Fig. 2 is a perspective and diagrammatic view of one modification of the supervisory device associated with a telegraph station.

In Fig. 1 two telegraph stations A and B are illustrated. They may be connected with one another either by hand or automatically by way of the central station O. At telegraph station A, Sk_1 represents the transmitting key, EM_1 the receiving relay, and K_1 the answering device. At station B there is likewise shown a transmitting key Sk_2 , a receiving relay EM_2 and an answering device K_2 . The answering or connection indicating devices K_1 and K_2 are located in the spaces A' and B' of the telegraph apparatus A and B.

In Fig. 2 a supervisory device A' is shown associated with telegraph station A.

The supervisory device A' shown in Fig. 2 will now be more fully described.

The supervisory device comprises electro-mechanical clockwork D, which is associated with a coil M connected to the source of current represented by the current mains N. Upon closing contact z the coil M is energized by way of the following circuit: line a' , contact v of the slow-release relay V, contact z , coil M and line b' . When coil M is energized its associated core g_2 is pulled into the coil M and the equal-armed lever g connected to g_2 by pin g_1 moves towards the coil M. The equal-armed lever g is rigidly connected to the shaft e of gear f , the gear being free to rotate upon the shaft e . In order to cause the core g_2 to return to its inoperative position upon the breaking of contact z , a spring h is attached to the other end of the lever g by means of a pin h_2 . This spring is securely suspended at its other end from a pin h_1 . By energizing the coil M the gear f is caused to mesh with the gear i and therefore i rotates. The gear i is keyed to the shaft K which is therefore rotated simultaneously with gear i . Mounted and keyed on the shaft K is a cam disc K_1 . A cam follower

K_3 travels on the periphery of the cam disc K_1 . This cam follower opens and closes a contact K_4 while passing over the projecting shoulders of the cam. The projecting shoulders of the cam are arranged at such distances from each other, that upon rotation of the cam disc K_1 they break the contact K_4 with a sequence similar to the impulses of a pre-arranged signal in the five-unit code if that code is used for ordinary transmission.

The arrangement is so adjusted that the cam disc K_1 will execute only one revolution. But variations in the number of revolutions or speed of cam disc K_1 may occur during the operation of the mechanism. This would interfere with the correct transmission of the answering signals. Thus, care must be taken that the speed of the clock-work is synchronized with and controlled by the driving motor of the telegraph apparatus. Such control is effected by means of a small synchronizing device S , in which the rotor S_1 is keyed to the shaft K . The synchronizing device S exerts a braking action if the clock-work D runs too fast and accelerates its speed if the clock-work is running too slowly. The synchronizing device S is energized from the current mains N through a commutator C arranged on the shaft r of the driving motor common to the telegraph apparatus, by means of two sliding brushes c_1 and c_2 . Either alternating or direct current may be used to drive the synchronizing device S . Thus the synchronizing device S may be supplied directly from the mains N .

If B is the calling station and A the called station, then by depressing a particular key a predetermined combination of signals will be transmitted from the calling station B to the called station A for the purpose of causing the clock-work D at the called telegraph station to turn shaft K .

A rod or typebar Z will be operated by this combination of signals at the desired called station. This rod is effective during its reciprocating movement to close and open the contact z , and simultaneously with this operation of z the clock-work D causes K to rotate upon the energization of coil M . Subsequently in consequence of the action of the spring h , gear F is again returned to its operative position. As the cam disc K_1 , rigidly connected with the clock-work D through a gear transmission by way of shaft K rotates, the telegraph line in which contact K_4 is situated, will be subjected to interruptions of current by the breaking of contact K_4 . These interruptions are sent back to the calling subscriber in whose apparatus the signals are recorded.

From the above description it follows that the answering signal may be sent back at any time by the depression of a special key provided at the calling station. Thus the transmitting subscriber may assure himself at any

time during the transmission period of the readiness of the receiving or called subscriber for reception. In this arrangement, however, the release of the supervisory device at the calling station must be avoided. This is effected in a simple manner by the depression of the key T adapted to close a contact t . This causes the energization of slow-release relay V in the calling subscriber's supervisory device, thereby opening the circuit of the calling subscriber's supervisory device by way of the contact v .

The slow-release relay V is constructed in any of the ways well known in the art, so that its rapidly attracts its armature and opens the contact v , but drops the armature off only after a considerable delay. Thus, even after key contact t is opened during the run at the called station of the combination of signals in its associated supervisory device, transmission of any part of the answering signal by the calling station will be avoided. In order to prevent the transmission of the answering signal, when the tape or paper strip has been broken or terminated, the tape P is run on a rail F . A light roller R connected to a contact spring P_1 travels upon this tape. Below spring P_1 is a contact p_2 . As soon as the paper strip breaks, the slot L in the guiding rail F is uncovered and the roller R mounted on the spring slips through. In consequence the following circuit is closed by way of the contact springs p_1 and p_2 : line a' , contact spring p_2 , contact spring p_1 , winding of the slow-release relay V and line b' . The slow-release relay V is then energized and the contact v is opened. Thus, the transmission of an answering signal by the calling station is prevented. The supervisory device may be operated again only, if tape P is again passed over the guiding rail F and the contact springs p_1 and p_2 thereby opened.

We claim:

1. In a telegraph system, the combination of a calling station, a called station connected thereto, supervisory apparatus at the called station, and means at the calling station for causing said apparatus to send back station identification signal only if the called station remains conditioned for reception.
2. In a printing telegraph system, the combination of a calling station, a called station connected thereto, a plurality of type bars and supervisory apparatus at the called station, and means at the called station for selecting and operating the type bars in response to signals transmitted from the calling station, the supervisory apparatus being responsive to the operation of a predetermined type bar to send back a station identification signal only if the called station remains conditioned for reception.
3. In a telegraph system, the combination of a calling station and a called station connected thereto, supervisory apparatus and a

tape recording device at the called station, means at the calling station for causing said apparatus to send back an answering signal only if the tape is in normal or unbroken condition.

4. In a telegraph system, the combination of a calling station and a called station connected thereto, supervisory apparatus and a tape recording device at the called station, means at the calling station for causing said apparatus to send back an answering signal only if the tape is in normal or unconsumed condition.

5. In a telegraph system, the combination of a calling station, a called station connected thereto, supervisory apparatus at the called station, and means at the calling station for causing said apparatus to send back an answering signal only if the called station remains conditioned for reception, and additional means adapted to limit the number of answering signals transmitted by the supervisory apparatus.

6. In a telegraph system, the combination of a calling station, a called station connected thereto, supervisory apparatus at the called station, and means at the calling station for causing said apparatus to send back a station identification signal only if the called station remains conditioned for reception and additional means at the called station adapted to maintain the answering signals in synchronism with signals transmitted by the calling station.

7. In a telegraph system, the combination of a calling station and a called station connected thereto, supervisory apparatus and a tape recording device at each of said stations, means at the calling station for causing the supervisory apparatus at the called station to send back an answering signal only if the called station remains conditioned for operation, and additional means at said calling station for maintaining supervisory apparatus thereat ineffective for transmitting an answering signal to the called station.

8. A telegraph system in accordance with claim 7, characterized in this, that said additional means comprises a slow release relay operable simultaneously with said first-mentioned means.

In witness whereof we affix our signatures.

ERWIN LIESK.

WILHELM KRUSE.