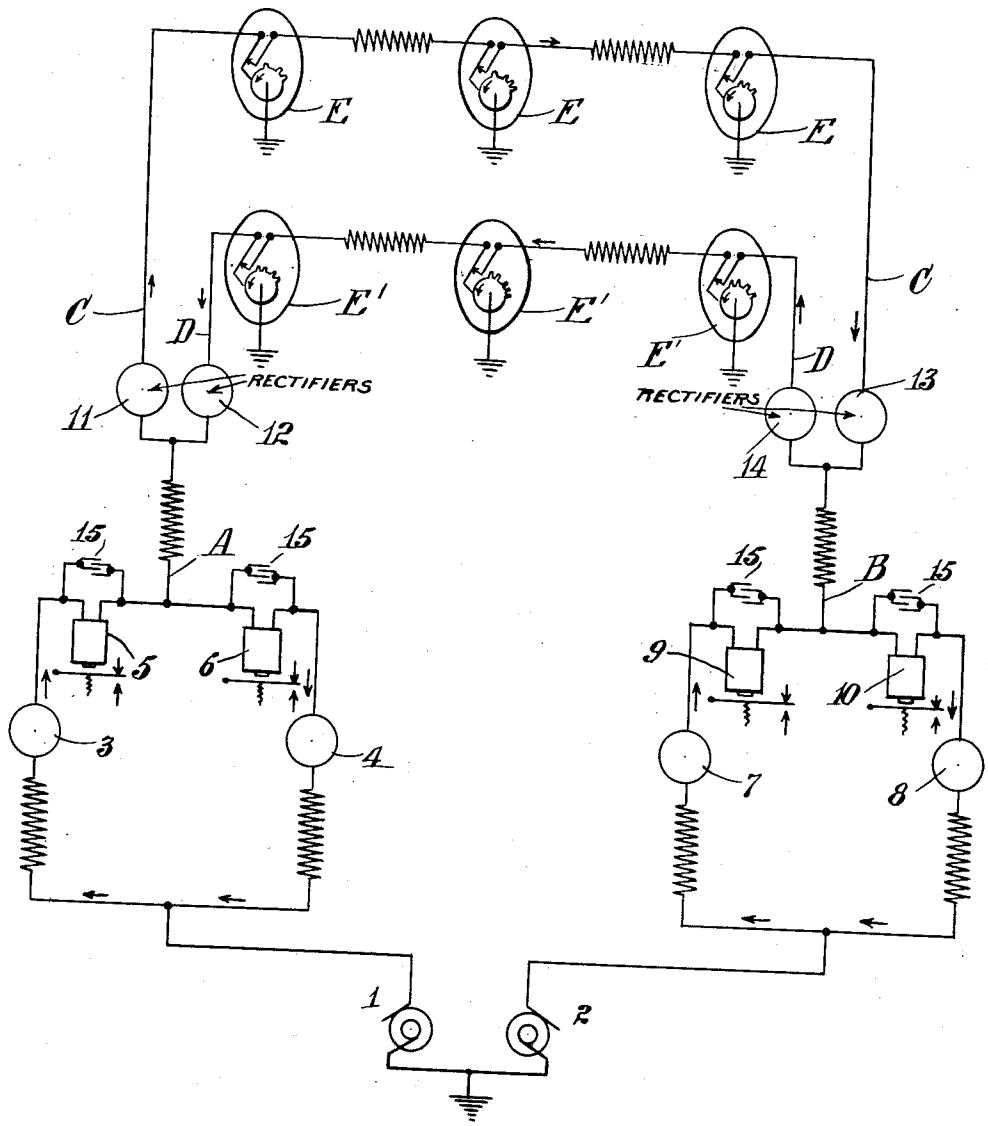
C. C. JOHNSON AND J. F. D. HOGE.

SIGNAL SYSTEM.

APPLICATION FILED JUNE 15, 1917.

**1,311,650.**

Patented July 29, 1919.




WITNESSES:

INVENTORS

BY

ATTORNEY.

# UNITED STATES PATENT OFFICE.

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## SIGNAL SYSTEM.

1,311,650. Specification of Letters Patent. Patented July 29, 1919.

Application filed June 15, 1917. Serial No. 174,867.

*To all whom it may concern:*

Be it known that we, CLARENCE C. JOHNSON and JOSEPH F. D. HOGE, citizens of the United States of America, and residents of the borough of Manhattan, city, county, and State of New York, have invented certain new and useful Improvements in Signal Systems, of which the following is a specification.

Our invention relates to signaling systems, particularly to those of the call box type, and is applicable particularly to messenger call box systems, burglar alarm systems, fire alarm systems, sprinkler supervisory systems, and other systems comprising transmitters, either automatically operated or hand operated, which are not so constructed as to require operation by a telegraph operator and of which a plurality are commonly placed in a single circuit, and are each arranged to transmit a characteristic signal to a central station. In the following description we will term these transmitters call boxes, but it will be understood that in so doing we do not limit ourselves to any particular type of transmitter; the particular construction of the transmitter itself forming no portion of the present invention.

Our invention comprises improved means whereby a plurality of call box circuits, each containing, if desired, a plurality of call boxes, may transmit their signals to central station apparatus over a single main circuit common to the call box circuits, and whereby alternating current may be supplied at the central station for the operation of the circuits and instruments of the system.

The object of our invention is, principally, to employ alternating current for the operation of the circuits and instruments of the system, while employing relays and signal boxes or call boxes of usual types, such as have been employed in the past in systems to which direct current has been supplied for operation; another object is to provide a simple system as free from liability to derangement as the former direct current system, and capable of using the same number of call boxes used in the direct current system.

We will now proceed to describe our invention with reference to the accompanying drawing, which illustrates, more or less diagrammatically, a call box system embodying our invention.

In the drawing, A and B designate the outgoing and return lines of the main circuit; and either of these conductors may be considered the outgoing conductor and the other the return conductor. C and D designate branch circuits from the main circuit A—B, each of these branch circuits containing call boxes, those in branch circuit C designated by character E, those in branch circuit D designated by character E′. We have not thought it necessary to illustrate the construction of these call boxes, since they may be of the usual type of box intended for so-called "McCulloh" service, *i. e.*, each box will have a double break wheel, one of which wheels is adapted to break and close the metallic circuit, the other to close and break the ground connection of the box. Such McCulloh service boxes are well known, the McCulloh system in itself being very old.

1 and 2 designate opposite terminals of a source of alternating current supply; of which 1 is connected, through suitable resistances, to opposite uni-directional rectifiers 3 and 4. In saying that these rectifiers are opposite, we mean that they are arranged to pass current impulses of opposite sign, respectively; one passing positive impulses, the other negative impulses. From these rectifiers, the current impulses pass through relays, 5 and 6 respectively, and thence to conductor A.

Similarly, terminal 2 is connected to opposite unidirectional rectifiers 7 and 8, whence the current impulses pass through relays 9 and 10 to conductor B.

Opposite uni-direction rectifiers 11 and 12 are interposed between conductor A and branch conductors C and D; likewise between conductor B and conductors C and D unidirectional rectifiers 12 and 14 are interposed.

The rectifiers are so arranged that positive impulses only may pass from 1 through rectifier 3, relay 5, rectifier 11, and circuit C, returning as negative impulses through rectifier 13, relay 10, and rectifier 8 to 2; and, conversely, negative impulses only may pass from one through 4, 6, 12, and returning as

positive impulses through circuit D, 14, 9, and 7 to 2.

If, now, one of these boxes in either circuit C or circuit D be operated, it will operate its corresponding relays, 5 and 10, or 6 and 9, as the case may be. Also, a box in circuit C may operate simultaneously with a box in circuit D.

Preferably, the magnet of each relay is shunted by a condenser 15. Such condenser discharges through the coils of its relay during the half-wave periods which that relay is prevented from receiving by the action of its corresponding rectifier; and thereby the armature of the relay is retained, and so prevented from chattering.

What we claim is:—

1. A signaling system comprising outgoing and return main circuit conductors, two branch circuit conductors connecting said main circuit conductors and each provided with a transmitter or transmitters, opposite unidirectional rectifiers interposed between each main circuit conductor and said branch circuit conductors, and arranged as to polarity to permit passage of positive impulses only through one said branch circuit and to permit passage of negative impulses only through the other branch circuit, and two signal receiving means and corresponding opposite unidirectional rectifiers connected to each main circuit conductor and arranged as to polarity to permit passage of positive impulses only through one receiving means and to permit passage of negative impulses only through the other companion receiving means.

2. A signaling system comprising outgoing and return main circuit conductors, two branch circuit conductors connecting said main circuit conductors and each provided with a transmitter or transmitters, opposite unidirectional rectifiers interposed between each main circuit conductor and said branch circuit conductors, and arranged as to polarity to permit passage of positive impulses only through one said branch circuit and to permit passage of negative impulses only through the other branch circuit, and two signal receiving means and corresponding opposite unidirectional rectifiers connected to each main circuit conductor and arranged as to polarity to permit passage of positive impulses only through one receiving means and to permit passage of negative impulses only through the other companion receiving means and condensers connected in shunt with respect to the corresponding signal receiving means and adapted by their discharge to magnetize said signal receiving means during the no-current periods produced by the action of the rectifiers.

In testimony whereof we have signed this specification in the presence of two subscribing witnesses.

CLARENCE C. JOHNSON.
JOSEPH F. D. HOGE.

Witnesses:
NELLIE HAIG,
ABIGAIL FAY MCCLEAN.