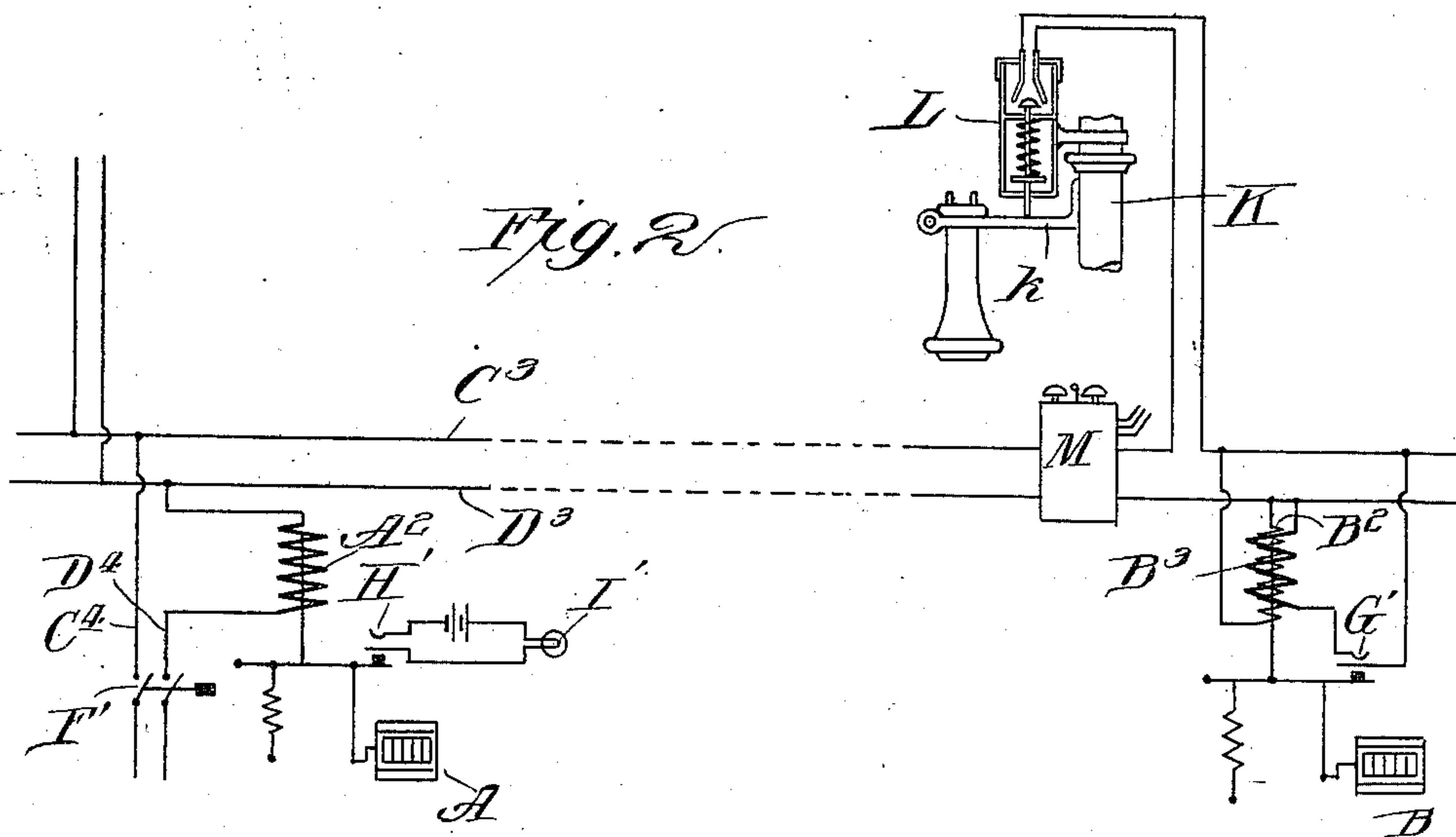
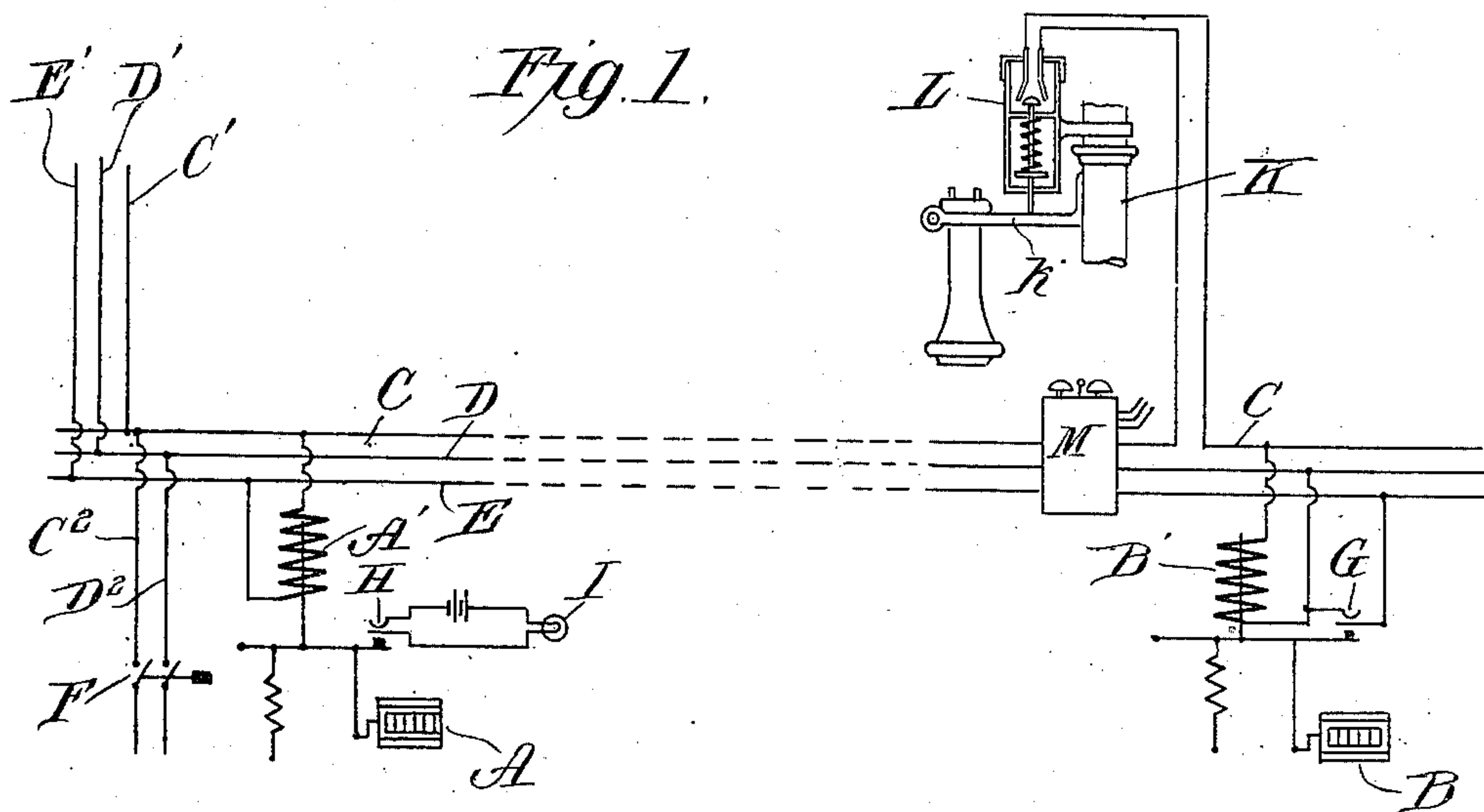


E. L. BUXBAUM.
SYSTEM FOR REGISTERING TELEPHONE CALLS.
APPLICATION FILED AUG. 5, 1910.

989,763.

Patented Apr. 18, 1911.



Witnesses

Harry S. Gaither
Ruby V. Brydges.

Inventor:

Emanuel L. Buxbaum

By Chamberlin & Freudenreich
attys

UNITED STATES PATENT OFFICE.

EMANUEL L. BUXBAUM, OF CHICAGO, ILLINOIS.

SYSTEM FOR REGISTERING TELEPHONE-CALLS.

989,763.

Specification of Letters Patent.

Patented Apr. 18, 1911.

Application filed August 5, 1910. Serial No. 575,621.

To all whom it may concern:

Be it known that I, EMANUEL L. BUXBAUM, a citizen of the United States, residing at Chicago, county of Cook, State of Illinois, have invented a certain new and useful Improvement in Systems for Registering Telephone-Calls, and declare the following to be a full, clear, and exact description of the same, such as will enable others skilled in the art to which it pertains to make and use the same, reference being had to the accompanying drawings, which form a part of this specification.

My invention, specifically considered, relates to telephone systems and has for its object to provide a reliable system for accurately registering the number of out-going calls.

A further object of my invention is to provide means for simultaneously registering out-going calls from a subscriber's station at the subscriber's station and at the central station without making it possible for the instrument at the central station to register a larger number of calls than those shown by the subscriber's instrument.

A further object of my invention is to provide a simple and novel system for accurately registering calls both at a central station and at a subscriber's station, without making it possible for the operator to actuate the registers when the subscriber's telephone is not in use.

The various features of novelty whereby my invention is characterized will hereinafter be pointed out with particularity in the claims; but for a full understanding of my invention and of its object and advantages, reference may be had to the following detailed description taken in connection with the accompanying drawing, wherein:

Figure 1 is a diagram illustrating one form of my invention; and Fig. 2 is a diagram illustrating a modification.

Referring to Fig. 1, A represents a register at a central station and B a register at a subscriber's station. A' and B' are actuating magnets for the registers A and B, respectively. The arrangement shown is that in which there are three wires, C, D and E in the telephone system between the central station and the subscriber's station and I have therefore arranged the parts of the registering system so as to utilize these wires. The terminals of the magnet A' are connected to wires C and E respectively.

The terminals of the magnet B' are connected to wires C and D respectively. C', D' and E' represent supply conductors which carry the current for telephoning and signaling. C² and D² represent supply conductors which carry the current for registering purposes, these conductors being connected respectively to the line wires C and D. F is a controller at the central station, this conveniently taking the form of a switch controlling the supply wires C² and D². G is a switch actuated with the register at the subscriber's station and arranged to connect the wires D and E together when the magnet B' is energized and the register B actuated. H is a switch associated with the register at the central station and is constructed and arranged to close a circuit through a lamp I or other indicator when the instrument at the central station is operated. K represents the telephone at the subscriber's station, and L a circuit breaker associated with the telephone and arranged in the wire C. The circuit breaker may of course take any usual form, that illustrated being one which is normally open and which is adapted to be closed by the hook $\frac{1}{2}$ of the telephone when the receiver is removed from the hook.

The operation is as follows: As long as the receiver is on the hook the controlling system for the registers is inoperative. As soon as the subscriber removes the receiver from the hook the circuit breaker is closed and then, upon closing the switch F at the central station, current flows from conductor C² through conductor C, through the cut-out box M, through the circuit breaker, through the coil of electro-magnet B', through the conductor D and cut-out box and back to supply conductor D². Thus the electro-magnet B' is energized and the register B is actuated. As soon as this occurs the switch G is closed and conductors D and E are connected together so that current can then pass from conductor C² through conductor C, through the coil of electro-magnet A', through conductor E, cut-out box, switch G, conductor D, and back to supply conductor D². Thus the electro-magnet A' is energized and the register A at the central station actuated. The actuation of the register at the central station causes the switch H to be closed and the lamp to be lighted. As soon as the lamp is lighted the switch F is opened or permitted

to open and the power for the registering circuit is cut off. It will thus be seen that no registration can be made as long as the receiver is upon the hook at the subscriber's station, and that no registration can be made at the central station until the registration has been actuated at the subscriber's station. Furthermore, the lamp or other signal at the central station gives a positive indication to the operator that both registers have been actuated.

In Fig. 2 I have shown an arrangement wherein the controlling system is modified to adapt it to a two wire telephone system. In this figure A and B represent the registers at the central station and at the subscriber's station respectively. C^3 and D^3 are the two telephone wires. A^2 is the actuating magnet for the register A, this magnet being so constructed and arranged that it will not operate unless there is considerable current flowing through the same; this being conveniently effected by making the coil of few turns and of low resistance. B^2 is the actuating coil of the magnet for the register at the subscriber's station. This coil is so arranged that it will be energized sufficiently to actuate the register with a much less current than that required to energize the magnet at the central station. B^2 is a holding coil for maintaining the register B² in the position brought about by the energization of the actuating coil. The terminals of the actuating coil are connected to the conductors C^3 and D^3 after they have passed through the cut-out box M' . One terminal of the holding coil is connected to the conductor D^3 and the other is connected to the conductor C^3 through a switch G' similar to the switch G in the other form. H' and I' represent a controlling switch and a signal associated with the register at the central station and corresponding to the parts H and I in Fig. 1. C^4 and D^4 are supply conductors for furnishing the current to actuate the registers, these conductors being connected to the wires C^3 and D^3 , respectively. The coil A^2 is in series with the conductor D^4 . F' is a controller corresponding to the controller F in Fig. 1. K is a telephone at the subscriber's station, h is the telephone hook and L is the circuit breaker which, in this case, is arranged to make and break the continuity of the wire C^3 .

The operation is as follows: When the receiver is removed from the hook and the switch F' closed, current flows from supply conductor C^4 , wire C^3 , cut-out M' , circuit breaker L, actuating coil B^2 , wire D^3 , coil A^2 at the central station and back to conductor D^4 . The current flowing through the controlling system is sufficient to energize the actuating coil at the subscriber's station so as to cause the register to be ac-

tuated, but it is not enough to energize the magnet at the central station. As soon as the subscriber's register is operated, the switch G' is closed and the holding coil is thrown across the circuit in multiple with the actuating coil. The parts are so proportioned and the potential of the supply circuit is such that the current is now increased in volume sufficiently to energize the magnet at the central station, so that the register at the central station is actuated. The holding coil prevents the register at the subscriber's station from returning to its normal position until the circuit is broken at the controlling switch at the central station or at the circuit breaker at the subscriber's telephone, so that there is no danger of causing the register at the subscriber's station from being operated more than once when the switch is closed at the central station. Furthermore, as in the other form of my invention, it is necessary that the register at the subscriber's station be operated before a registration can be made at the central station, so that the reading at the central station can never be greater than that at the subscriber's station. The arrangement which I have shown at the subscriber's station avoids the breaking of a circuit at this point and thus avoids injury to the contacts and lessens the need for inspection and repair. It will of course be understood, however, that various other arrangements may be employed which will cause the subscriber's register to be actuated under a small current and which will then increase the volume of the current and cause the register to be held in its actuated position while the register at the central station is actuated.

While I have illustrated and described with particularity only a single form of my invention I do not desire to be limited to the specific details so illustrated and described; but intend covering all constructions and arrangements which fall within the terms employed in the definitions of my invention constituting the appended claims.

What I claim is:

1. In combination with a telephone system, a registering instrument at a central station, a registering instrument at a subscriber's station, and actuating means controllable from the central station for causing said instruments to be actuated, said actuating means including means controlled by the instrument at the subscriber's station for governing the actuation of the instrument at the central station.

2. In combination with a telephone system, a registering instrument at a central station, a registering instrument at a subscriber's station, an electro-magnetic actuating means associated with each of said instruments, a controlling system for said actuating means in-

cluding a controller at the central station, and means associated with the instrument at the subscriber's station for governing said controlling system so as to govern the actuation of the instrument at the central station.

3. In combination with a telephone system, a registering instrument at a subscriber's station, a registering instrument at a central station, an electro-magnetic actuating device associated with each of said instruments, a controlling system for said actuating devices including a controller at the central station, and a switch controlled by the instrument at the subscriber's station for varying the circuit conditions in said controlling system.

4. In combination with a telephone system, a registering instrument at a subscriber's station, a registering instrument at a central station, an electro-magnetic actuating device associated with each of said instruments, a controlling system for said actuating device including a controller at the central station, said controlling system being connected with the actuating device at the subscriber's station so as to energize the same when the controller at the central station is operated, and means associated with the instrument at the subscriber's station for changing the circuit conditions in said controlling system so as to cause the actuating device at the central station to be energized.

5. In combination with a telephone system, a registering instrument at a subscriber's station, a registering instrument at a central station, an electro-magnetic actuating device associated with each of said instruments, a controlling system for said devices including a controller at the central station, said controlling system being connected to the actuating device at the subscriber's station so as to energize the same when the controller is operated, means associated with the instrument at the sub-

scriber's station for varying the circuit conditions in said controlling system upon the actuation of the device at the subscriber's station to produce an energization of the actuating device at the central station, a signal at the central station, means for causing said signal to be operated upon the actuation of the latter instrument.

6. In combination with a telephone system having a telephone at a subscriber's station, a registering instrument at the subscriber's station, a registering instrument at the central station, an electro-magnetic actuating device associated with each of said instruments, a controlling system for said actuating device including a controller at the central station, a switch actuated with the telephone at the subscriber's station for rendering said controlling system inoperative when the receiver is hung up, said controlling system being connected to the actuating device at the subscriber's station so as to energize the same when the controller at the central station is operated, and means associated with the instrument at the subscriber's station for varying the circuit conditions in said controlling system upon the actuation of the latter instrument so as to produce an energization of the actuating device at the central station.

7. In combination with a telephone system, a register at a subscriber's station, an actuating magnet for the register, a controlling system for said magnet extending to the central station, a controller in said system at the central station, a signal at the central station, and means associated with said register for controlling said signal.

In testimony whereof, I sign this specification in the presence of two witnesses.

E. L. BUXBAUM.

Witnesses:

WM. F. FREUDENREICH,
RUBY V. BRYDGES.