I. D. FELLOWS.

EMERGENCY SIGNALING DEVICE FOR TELEPHONE EXCHANGE SYSTEMS.

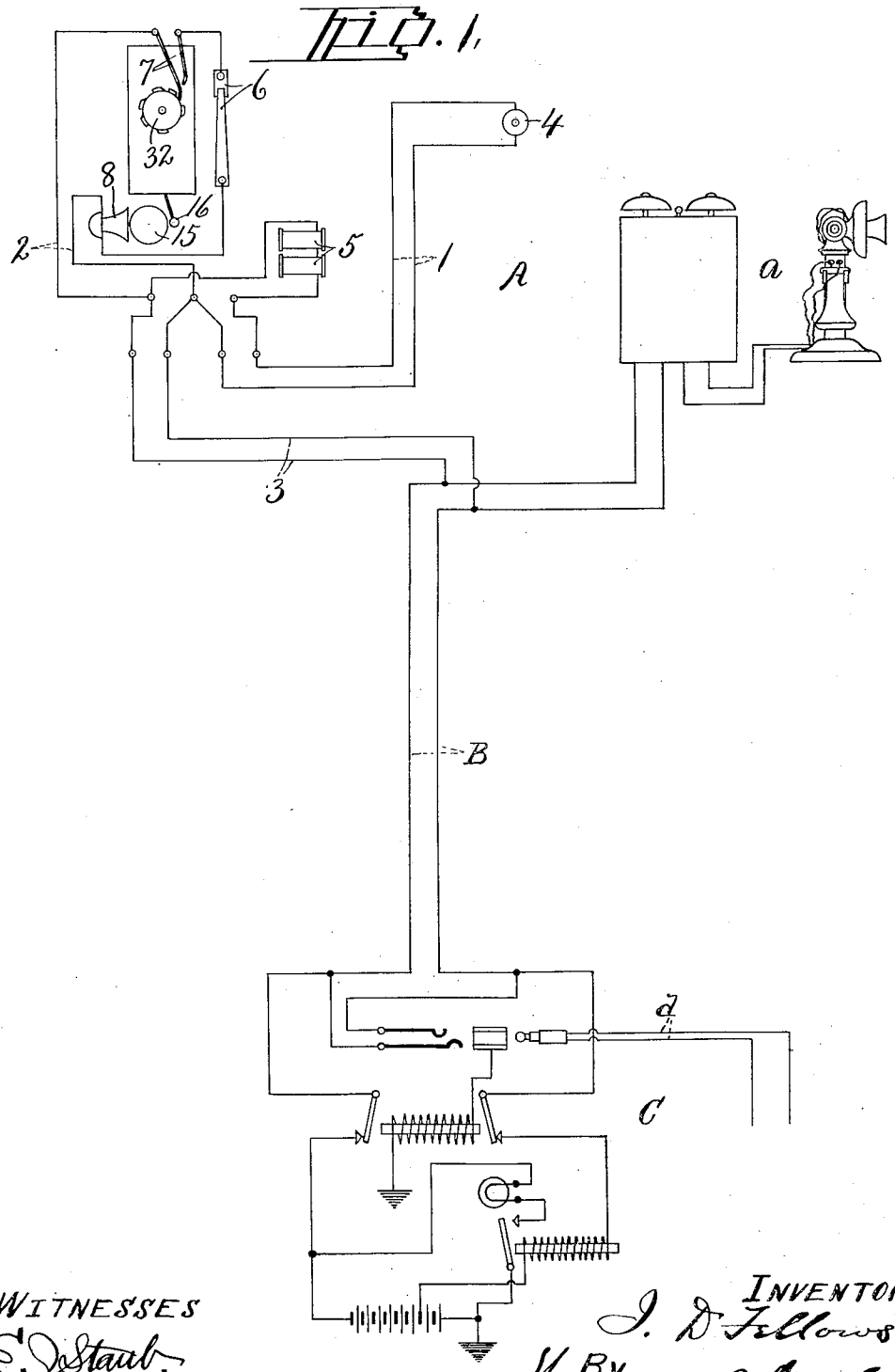
APPLICATION FILED FEB. 25, 1911.

1,039,667.

Patented Sept. 24, 1912.

2 SHEETS—SHEET 1.

Fig. 1.



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2 SHEETS—SHEET 2.

Fig. 2.

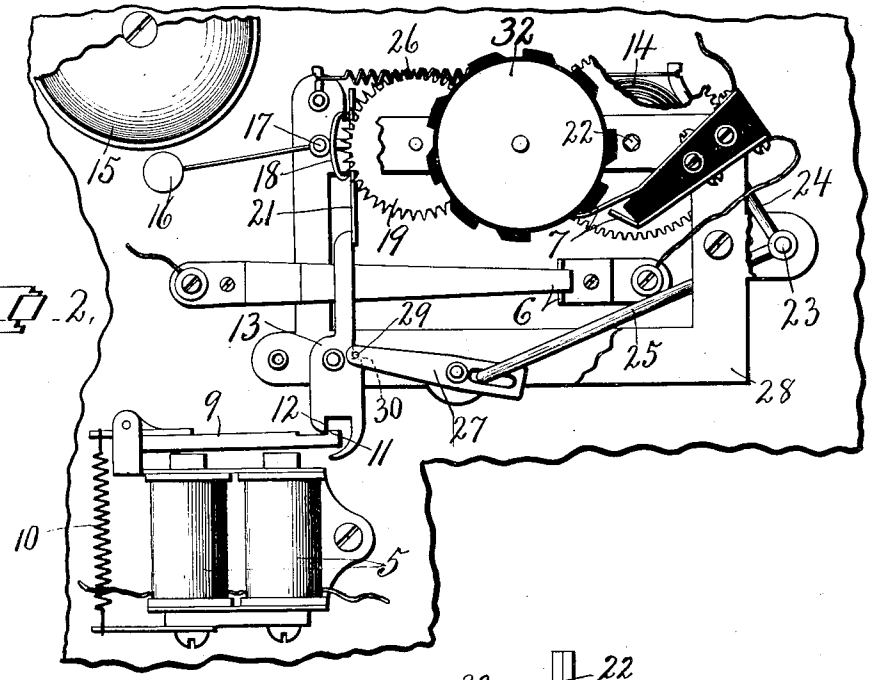


Fig. 3.

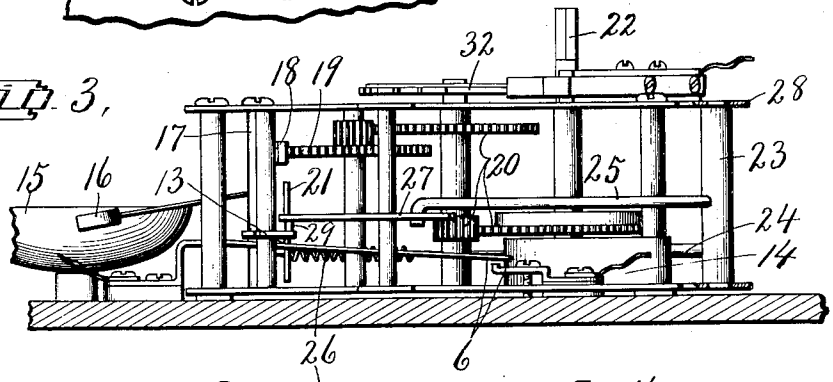
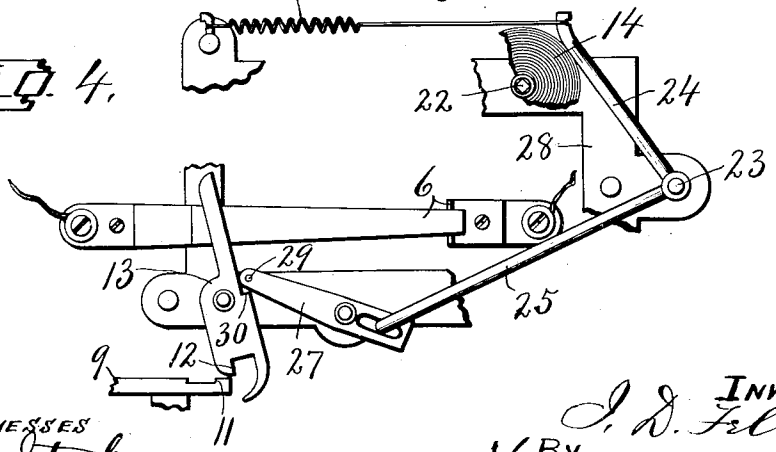


Fig. 4.



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EMERGENCY SIGNALING DEVICE FOR TELEPHONE-EXCHANGE SYSTEMS.

1,039,667. Specification of Letters Patent. **Patented Sept. 24, 1912.**

Application filed February 25, 1911. Serial No. 610,770.

To all whom it may concern:

Be it known that I, IRVING D. FELLOWS, of Syracuse, in the county of Onondaga, in the State of New York, have invented new and useful Improvements in Emergency Signaling Devices for Telephone-Exchange Systems, of which the following, taken in connection with the accompanying drawings, is a full, clear, and exact description.

This invention relates to certain improvements in emergency signaling apparatus for telephone exchange systems somewhat similar to my pending application No. 610,769, filed Feb. 25, 1911, except that it is set in motion at will instead of automatically.

The main object is to enable any telephone subscriber to send an emergency call over the telephone line circuit to the central station independently of the subscriber's telephonic instruments through the medium of the usual audible or visual signal or signals without in any way altering or interfering with the construction or operation of the telephonic system and in such manner that the central operator may instantly distinguish such call from the usual telephonic call for immediate transmission to the police station to notify the police that the subscriber is in urgent need of their services.

Another object is to enable the signal operating mechanism to be set in motion by a single noiseless movement of the finger or hand of the operator from any point or points remote from such mechanism so that even though the telephones may be disconnected by a burglar or other intruder or the operator incapacitated by fright, injury or threats of bodily harm, the mechanism will continue to operate to repeat the call for a considerable period of time independently of the operator until automatically stopped by its own action. In other words, I have sought to provide the subscriber with a simple device capable of being installed in any part of a building and connected in the usual telephone line circuit preferably at some concealed point in the building between the telephone and central station so as not to interfere with the free operation of the telephone in the usual manner and adapted to be set in motion at will by a single operation, as, for example, the noiseless pressing of a button so that after such device has been set in motion, it will continue to operate to send in repeated calls at the central station without further attention or manipulation by the operator at the subscriber's station, whereby the subscriber may silently and noiselessly obtain the services of the police from the central station without the knowledge of the burglar or other intruder which may be the cause of such an emergency call.

A still further object is to provide each apparatus with a sound producing device and separate transmitter connected in the line circuit for the transmission of an audible alarm to the central office through the medium of the central operator's receiver when connected in the line circuit in addition to the operation of the lamp signals so as to render the emergency call doubly distinctive from the usual telephonic call and thereby secure the services of the police more quickly and with greater certainty.

Other objects and uses will be brought out in the following description.

Figure 1 is a diagrammatic view of a subscriber's telephone and line circuit showing a portion of the central station and electrical connections of my emergency signaling device. Fig. 2 is a top plan of the signal operating mechanism, the parts being shown in their normal positions of rest. Fig. 3 is a side elevation of the same mechanism. Fig. 4 is a top plan of a portion of the same mechanism showing more particularly the motor controlling device.

In Fig. 1 I have shown a subscriber's station —A— having the usual telephonic instruments —*a*— connected in the ordinary manner by a line circuit —B— to a central station —C—, a portion of which is shown diagrammatically as provided with the usual signal lamp —*c*— and cord circuit —*d*— together with other apparatus or devices commonly employed in exchange systems of this character.

The signal operating mechanism forming the subject matter of this invention is located at the subscriber's station preferably within the same building in which the telephone apparatus —*a*— is installed and preferably comprises a branch controlling or releasing circuit —1— and a branch signaling circuit —2— both of which are connected by conductors —3— across the main line circuit —B— at a point near the subscriber's telephone instruments —*a*— but between said instruments and central station so as

not to interfere in any way with the free operation of the telephones in the usual manner at any time even though the emergency signaling apparatus may be in motion.

A circuit closer —4— and electromagnet —5— are electrically connected in series in the branch circuit —1— for controlling the action of the signal operating mechanism presently described, the electromagnet —5— being usually associated or mounted in the same case with the signaling apparatus which may be located in any remote or concealed part of the building out of the way of burglars or other intruders while the circuit closer —4— is usually placed in the living room, bed room, office or other place where it is easily accessible at any time for operation to release the signal operating mechanism when required.

The signal operating mechanism comprises in its organization a primary circuit closer —6—, a secondary circuit closer —7— and a transmitter —8— all of which are electrically connected in series in the signal circuit —2— which as previously stated is electrically connected across the subscriber's line circuit by the conductors—3—.

The circuit closer —4— is normally open and preferably consists of a push button or similar noiseless switch and constitutes the initial means for controlling the action of the signaling apparatus and is used solely for closing the circuit through the electromagnet —5— which is energized by current from the usual source of electric energy at the central station.

The electromagnet —5— is provided with a pivoted armature —9— which is normally held in its retracted position by a spring —10— and is provided at one end with a shoulder —11— constituting a detent for engagement with a coacting shoulder —12— on one end of an oscillatory stop lever —13— for controlling the action of a coiled spring motor —14—. This motor constitutes the main driving means for the automatic signaling apparatus including the circuit closures —6— and —7— and a sound producing device as a bell —15— and hammer —16— which is located in proximity to the mouth of the transmitter —8— for sending audible signals over the main line circuit to the central station.

The hammer —16— is secured to a rock shaft or spindle —17— having an escapement —18— coacting with an escapement wheel —19— which is connected by a gear train —20— to spring motor —14—, said spindle or rock shaft —17— being also provided with a fan blade governor or rock arm —21— which is normally engaged by the stop lever —13— to control the action of the motor in a manner hereinafter more fully described.

The motor —14— is shown in its extended or expanded position assumed when wholly or partially unwound or run down and is adapted to be wound up or contracted in the usual manner for clock springs by the application of a key not shown to a spindle —22— to which one end of the spring motor —14— is attached. This radial expansion and contraction of the spring motor —14— is utilized to control the operation of the stop lever —13— and thereby control the action of the motor and for this purpose I have provided a rock shaft or spindle —23— having radially projecting arms —24— and —25— one of which as the arm —24— is spring pressed against the periphery of the outer helix of the spring coil —14— by a comparatively light spring —26— while the other arm —25— is connected with a lost motion to a lever —27— which is fulcrumed on the main supporting frame —28— and is provided with a shoulder —29— for engagement with a coacting shoulder —30— on one side of the stop lever —13— preferably close to its pivot so that when the motor spring —14— is contracted, the arm —24—will be drawn by the spring —26— inwardly toward the axis of the spring, thereby rocking the other arm —25— outwardly and forcing the shoulder —29— free from the shoulder —30— to allow the operation of the lever —13— when disconnected from interlocking engagement with the armature —19— or detent —11—.

When the armature —8— is attracted by the energizing of the magnet —5—, the detent —11— is disengaged from the shoulder —12—, thereby releasing the lever —13— thus permitting the action of the motor and allowing the escapement arm —21— actuated thereby to force the lever —13— from its locking position or out of the path of movement of its actuating arm —21—. As the spring motor continues to operate, it will, of course, gradually expand against the arm —24—, thereby rocking said arm outwardly and similarly rocking the arm —25— inwardly until the latter has moved the locking lever —27— a sufficient distance to again bring its shoulder —29— into locking engagement with the shoulder —30— of the lever —13—, thereby returning said lever —13— into interlocking engagement with the armature —9— and stopping the motor against further action.

Secured to one of the comparatively slow rotating spindles of the gear train —20— is a toothed wheel —32— having a plurality of sets or groups of teeth for engaging and intermittingly closing and opening the normally open circuit closer —7—, the number of teeth in each group being different and gradually increasing in a direction opposite to that of the direction of rotation of the wheel and in this instance are arranged in

sets of two, three and four each for impressing corresponding current impulses with intervening pauses on the main line circuit and through the signal lamp at the central station while the motor is in action. The circuit closer —6— is also normally open when the motor is at rest but is closed by contact of the arm —13— therewith immediately upon releasing the motor. For this purpose one of the terminals of the circuit closer —6— extends beyond and in close proximity to the overlying portion of the lever —13— and is inclined so that when the lever —13— is released from interlocking engagement with the armature —9— by the energizing of the electromagnet —5— and is forced from its normal position against the underlying inclined face of said terminal, the latter is depressed into contact with the other terminal, thereby closing this portion of the circuit and keeping it closed until the lever —13— is again returned to its normal position in interlocking engagement with the armature —9— by the expansion of the spring —14—.

In operation assuming that the spring motor —14— has been wound up and thereby contracted from the position shown sufficient to allow the arm —25— to rock the lever —27— from locking engagement with the lever —13— or to the position shown in Fig. 4 and that the lever —13— is still in interlocking engagement with the armature —9—, thereby locking the motor against action. Now in case an emergency call is required, the operator simply pushes the button —4— to close the branch circuit —1—, thereby energizing the magnet —5— and attracting the armature —9— from its normal locking position to release the arm —13—, whereupon the spring motor —14— will immediately cause the operation of the rock arm —21— to rock the lever —13— from its normal position or to the position shown in Fig. 4, thereby closing the circuit closer —6—. The toothed wheel —32— will then be operated by the action of the motor to intermittingly close the circuit closer —7— thereby impressing corresponding current impulses upon the main line circuit —B— and producing corresponding impulses in the local lamp signal or signals at the central station.

Simultaneously with the operation of the lamp signals, the sound producing device or bell hammer —16— is operated by the vibration of the escapement spindle —17— to cause such sounds to be transmitted over the line circuit and to the central operator's receiver through the transmitter —8—. These signals are, of course, distinct from the usual telephonic call signals and indicates at once to the operator that it is an emergency call for police protection which is to be transmitted at once through the usual telephonic mediums to the central station, thereby enabling the subscriber to secure the services of the police without any further effort than the pressing of the button —4—. This operation of the signals continues until the motor —14— is unwound or expanded sufficiently to return the rock arms —24— and —25— and levers —27— and —13— to their normal locking positions, thereby automatically stopping further action of the motor.

What I claim is:

1. In combination with a normally open subscriber's line circuit of a telephone exchange system, a subscriber's branch circuit connected across the line circuit, a manually operated circuit closer in the branch circuit, an additional branch circuit connected across the first named branch circuit, a motor-actuated circuit closer connected in said additional branch circuit for impressing current impulses upon the line circuit to operate a central signal, the motor, means normally holding the motor against operation, and additional means actuated by the energizing of the first named branch circuit through the medium of the manually operated circuit closer for releasing said holding means to permit the operation of the motor.

2. In combination with a normally open subscriber's line circuit of a telephone exchange system, a subscriber's branch circuit connected across the line circuit, a manually operated circuit closer in the branch circuit, an additional branch circuit connected across the first named branch circuit, a motor-actuated circuit closer connected in said additional branch circuit for impressing current impulses upon the line circuit to operate a central signal, the motor, means normally holding the motor against operation, additional means actuated by the energizing of the first named branch circuit through the medium of the manually operated circuit closer for releasing said holding means to permit the operation of the motor, a transmitter connected in the additional circuit, and a sound producing device actuated by the motor for operating said transmitter to transmit such sound over the line circuit.

3. In combination with a normally open subscriber's line circuit of a telephone exchange system, a subscriber's branch circuit connected across the line circuit, a manually operated circuit closer in the branch circuit, an additional branch circuit connected across the first named branch circuit, a motor-actuated circuit closer connected in said additional branch circuit for impressing current impulses upon the line circuit to operate a central signal, the motor, means normally holding the motor against operation, additional means actuated by the energizing of the first named branch circuit through the medium of the manually operated circuit closer for releasing said holding means to

permit the operation of the motor, and means actuated by the motor for automatically restoring the holding means to its holding position to stop the motor.

4. In combination with a normally open subscriber's line circuit having the usual signals, transmitters and receivers connected therein, a subscriber's branch circuit connected across the main line circuit, a manually operated circuit closer in the branch circuit, an electromagnet also connected in the branch circuit, an additional branch circuit connected across the first named branch circuit between the electromagnet and points of connection with the first named branch circuit with the line circuit, a separate transmitter connected in the additional branch circuit, a spring motor, a sound producing device actuated by the spring motor for operating the last named transmitter to transmit such sound to the line circuit, means controlled by the electromagnet for normally holding the motor against operation and adapted to be operated by the energizing of the magnet caused by the closing of the circuit closer, and additional means actuated by the motor for restoring the holding means to its holding position to stop the motor.

5. In combination with a normally open subscriber's line circuit of a telephone exchange system having the usual signals, transmitters and receivers connected therein, a branch circuit connected across the line circuit, a normally open manually operated circuit closer in the branch circuit, a transmitter connected to the branch circuit, a sound producing device for operating the transmitter, and means brought into action by the closing of the circuit closer for operating the sound producing device.

6. In combination with a normally open subscriber's line circuit of a telephone exchange system, a subscriber's branch circuit connected across the line circuit, an additional branch circuit connected across the first named branch circuit, a normally open switch and a motor-actuated circuit closer both connected in the additional branch circuit, a motor for operating the circuit closer, means normally holding the motor against action, manually operated means for closing the first-named branch circuit, and additional means actuated by the energizing of such branch circuit for releasing said motor holding means.

7. In combination with a normally open subscriber's line circuit of a telephone exchange system, a subscriber's branch circuit connected across the line circuit, an additional branch circuit connected across the first named branch circuit, a normally open switch and a motor-actuated circuit closer both connected in the additional branch circuit, a motor for operating the circuit closer, means normally holding the motor against action, manually operated means for closing the first-named branch circuit, additional means actuated by the energizing of such branch circuit for releasing said motor holding means, and further means actuated by the motor for automatically stopping such motor.

8. In combination with a normally open subscriber's line circuit of a telephone exchange system, a subscriber's branch circuit connected across the line circuit, an additional branch circuit connected across the first named branch circuit, a normally open switch and a motor-actuated circuit closer both connected in the additional branch circuit, a spring motor for operating the circuit closer, means normally holding the motor against action, manually operated means for closing the first named branch circuit, additional means actuated by the energizing of such branch circuit for releasing said holding means, and further means actuated by the expanding of the motor spring for restoring the holding means to its holding position to stop the motor.

In witness whereof I have hereunto set my hand on this 11th day of February 1911.

IRVING D. FELLOWS.

Witnesses:
H. E. CHASE,
E. F. SPEARING.